MAGAZINE

OF

ZOOLOGY AND BOTANY.

ORIGINAL COMMUNICATIONS.

I.—*A Revision of the Genera of Bats (Vespertilionidæ), and the Description of some new Genera and Species.* By JOHN EDWARD GRAY, F. R. S., President of the Botanical Society of London, &c. &c.

SOME of the older authors placed these animals with the Birds, but Ray (Syn. Anim. Quad., p. 43,) properly arranged them with the Mammalia, and formed them into a particular group, of which he only knew a single species; Linnæus divided the few species he knew into two genera, which, on account of the difference in the number of their teeth, he placed in two different orders, an error which he was not often guilty of committing, and which Pennant, Pallas, and Brisson corrected, by referring them back to a single genus; but the latter author (Le Règne Animal, 4to,) in 1762, divided in his specific characters, the fruit-eating bats from the insectivorous ones, by the number of their claws; and this group was long afterwards converted into a genus by Geoffroy, under the name of *Pteropus;* Daubenton in 1759 (Mem. Acad. Paris,) described several new species, and gave some figures of the heads of these animals, which greatly facilitated their determination. Pallas, in 1767, (Spic. Zoolog. 6,) when describing many new species, showed that the bats might be divided into sections by the number of their teeth; and Erxleben (Sys. Anim.) 1777, acting on Pallas's suggestions, divided the bats into two genera, giving to those that have four cutting teeth in the upper and lower jaw the name of *Pteropus*, and retained in the genus *Vespertilio* the other bats; which he divided into sections according

to the absence, presence, and number of these appendages. These divisions were adopted by Gmelin (Syst. Nat. 1. 45.), who reduced the genus established by Erxleben to the rank of a section. In 1805, M. Geoffroy St Hilaire, who was then employed in naming the Mammalia in the Paris collection, commenced a series of papers in the Annales du Museum, in which he established various genera of these animals, described the different species which he referred to them, and illustrated them with figures. Cuvier in 1817 (Règne Animal,) placed the bats with the insectivorous Mammalia, and divided the insectivorous genera into groups according to the number of the phalanges of the index and middle finger; and his system has been very generally followed, and from time to time new genera have been added by Dr Horsfield, F. Cuvier, Charles Bonaparte, and others. Dr Leach, in 1822, (Linn. Trans. xiii.) published two papers, in which he described and figured some new genera. One of the papers is on those "bats with foliaceous appendages to the nose;" and the other for those that were without these organs. In 1823, Spix, in his work on the South American monkeys and bats, adopted these divisions, and gave a Latin name to them, and he has been generally quoted as the founder of these sections. Such was the state of the science when, in 1826, I published a short paper in the Annals of Philosophy, and in 1829 a second in the Zoological Journal (p. 242,) in which I divided the bats into five natural sections; and in the Philosophical Magazine for the same year I printed a revision of the genera from personal examination, and added to it an artificial table, for the purpose of facilitating the discovery of them. This paper was translated into Latin by Dr Fischer (Synop. Mamm. 659,) and into German by Oken in the Isis, and into French by Lesson in his Manuel; and the arrangment has been adopted by Mr Swainson in Lardner's Encyclopædia; and, lastly, by the anonymous writer on bats in the Penny Encyclopædia, who, having merely translated the article from Lesson's Manuel, erroneously attributes it to that author, though Lesson quotes me as the author of the tribes. The accompanying paper may be considered as an abridgement of a further revision and extension of that article; and for the purpose of writing it, I have examined all the bats which have passed through my hands, or that I have been able to see in the English collections and in the Government museums of France, Germany, and Holland; and I hope, that I shall not now hear persons complain of the difficulty they experience in making out the species, much less the genera of these interesting animals. I believe that the real cause of the difficulty is the little attention that zoologists have paid to them, and, as a proof of this inattention, I am induced to give a sketch of the history of

the discovery of the various species which inhabit this country. Ray and Merret, as I have before observed, only knew a single species, and this was the only one recognized as British, until the year 1738, when Albin first figured (Birds, t. 101.), and 1766, George Edwards again figured the long-eared bat in his work on Birds (t. 201. f. 3.); and Pennant recorded these two in his first edition of the British Zoology. In his succeeding editions he extended the number to 4, adding the *Noctule* on the authority of the Rev. Dr Buckworth, who had observed a large bat, which Pennant thought to be this species, (Brit. Zool. Illust. 1770–85,) at Queen's College, Cambridge; but the Rev. Gilbert White had written to him, and given him a good history of this bat in 1769, (Hist. Selborn, 1779, 75, 76,) and secondly, the horse-shoe bat, *Rhinolophus ferrum equinum*, which had been discovered by Mr (afterwards Dr) Latham at Dartford. In 1806 (Ann. Mus. viii. 198,) M. Adolphe Brongniart, when travelling from Dover to London, discovered a new species which was described under the name of *V. emarginatus;* and, in 1808, Montagu in the Linnæan Transactions (i. 71,) added to those already known, the little horse-shoe (*Rhinolophus hipposideros*), and the barbastelle (*Vesp. Barbastellus;*) but it is doubtful if the animal described by Montagu was the real barbastelle, for the remains of the specimen so named in his collection, was certainly *Vesp. mystacinus* of Kuhl, but the fact of the *Barbastelle* being British was fully established in 1805, by the figure of it given by Mr Sowerby in his British Miscellany, from a specimen found by Mr Peate at Dartford.

In 1825, Dr Leach described and figured in the Zoological Journal, (7, t. 22.) what he considered as a new species, under the name of *Vespertilio pygmeus*, sending the specimen described to the British Museum. In 1826, feeling from the experience that I had gained when studying with that great reformer of zoology in England Dr Leach, that the British bats had not had the attention paid to them that they deserved, I examined the various specimens collected by Dr Leach, myself, and our correspondents, which were then in the British Museum, and in the Zoological Journal (p. 108) for that year, I gave a list of the specimens then in the collection, and by that means added the four following species, viz. *Vespertilio Bechsteinii, V. Nattereri, V. serotinus*, and *V. mystacinus*. Dr Fleming having overlooked my paper in 1828, when his work on British Animals appeared, merely gave the species that were known before its publication; while the Rev. Leonard Jenyns and Mr Bell, in their works on the British Mammalia, have been able to add two more species to the list, viz. *V. Leisleri* and *V. discolor*, which I had added to the mu-

seum collection since the publication of my paper, the latter of them having been sent from Plymouth by Dr Leach. In 1833, Mr Leonard Jenyns (Lin. Trans. xvi. 55, t. 1, f. 2.) described what he considered as a species under the name of *Plecotus brevimanus;* but from the observations which I have been enabled to make on the development of the wings of these animals, (Phil. Mag. and Annals, vi. 1829–35,) which do not gain their full size until after the animal has done suckling, I am now certain that both the *Vesp. pygmeus* and *Plecotus brevimanus* are only the young states of other species, the latter being the young of the long-eared bat, and the former most probably the young of the pipistrelle; and I am borne out in this opinion by the soft state of the cranium, the large size of the joint arising from the epiphysis of the bones not being knit, of the specimen of both these animals which have come under my notice, and I may observe, that the first joint of the middle-finger of all the adult bats I have examined is as long as the arm-bone, which is not the case in these animals.

Fam. V. Vespertilionidæ.

The limbs elongated; fingers of the fore-hands and tail enclosed in a nearly naked membrane, serving for wings; fingers very long; thumb free, clawed; toes of hind-feet short, equal clawed; teeth variable.

A. Istiophori, or *Leafnose bats. Nostrils placed in a bald space, often elevated behind into a leaf; teeth acutely tubercular; index-finger not clawed.*

Tribe I. *Leafnose kind.* Phyllostomina.

Nose-leaf expanded into a leaf behind, simple and pierced with the nostrils in front; ears lateral, separate.

† *Forehead pitted; ears close together.* Old World.

1. Rhinopoma, Geoff. Tail long, exserted beyond the short interfemoral membrane; forehead with a deep pit; ears close together; nose-leaf small.

Indian Rhinopome. Rhinopoma Hardwickii, *Gray.* Zool. Misc. 37. Inhabits India. Gen. Hardwicke.

Egyptian Rhinopome, Rhinopoma microphylla, *Geoff.* Vesp. microphyllus, *Schreb.* Brunnich, Cat. Copenh. t. 6, f. 1–4. Inhabits Egypt. Dr Rüppell.

See also Rhinopoma Carolinensis, *Geoff.* if a true Rhinopome?

† † *Forehead simple, ears lateral, tongue short, under lip entire with a triangular smooth space in front.* New World.

2. Arctibeus, *Leach.*—Phyllostoma, *Spix.*—Tail round (none?) interfemoral membrane deeply cut in, forehead simple, ears far apart, lateral, nose-leaf simple lanceolate.

* *The inner edge of the lips not fringed.*

Jamaica Arctibeus. Arctibeus Jamaicensis, *Leach.*—Phyllostoma Jamaicensis, *Horsf.* Zool. Journ.; young, Madateus Lewisii, *Leach.*—Tragus with 1 or 2 lobes on the middle of its hinder edge. Inhabits Jamaica, Cuba, Mr Redman.

See also Arctibeus planirostris. Phyllostoma planirostre, *Spix*, Braz. t. 36, f. 1. "Tragus lobed," *Spix.*

Fringed-lipped Arctibeus. Arctibeus fimbriatus, *Gray.*—Nose-leaf elongate, lanceolate, apex with a broad midrib; fur mouse-colour, very soft, with pale tips, rather paler beneath than above; fore-arm and under side of the wing near the fore-arm and side of the body with scattered fur; the front of the lower lip with a semiovate space, with a central tubercle surrounded by small warts. Expanse 17″. Inhabits Brazil.

Sooty Arctibeus. Arctibeus fuliginosus, *Gray.*—Fur sooty-black; wings and membrane black; chin with a triangular space, having 5 or 6 warts on each side; nose-leaf ovate-lanceolate, acute, with a deep groove parallel to the edge of each side, front part free on the edge; lips fringed; ears moderate, rather naked, black. Expanse 16″; body and head 3″, arm-bones 2″ 6‴. Inhabits S. America. Museum Lyons.

See also Arctibeus lineatus, *Gray.*—Phyllostomus lineatus, *Illiger*, Licht Doub. 3, Phyll. lineatum, *Geoff.*

* * *Lips not bearded internally.*

Lobed Arctibeus. Arctibeus lobatus, *Gray.*—Tragus 3 lobed. Inhabits——? British Museum.

Arctibeus perspicillatus.—Phyllostoma perspicillatum, *Geoff.* Ann. Mus. xv. t. ii. P. superciliarum, *Pr. Max.* P. lineatum, *Geoff.?* Vesp. perspicillatus, *Linn.* Grande fer de lance, *Buffon*, Suppl. vii. t. 74, cop. Encycl. Meth. t. 32, f. 4. Phyllostomus lituratus, *Illig.* Licht. Phyll. lineatus, *Illiger.* Collection of Mr Swainson.

3. Vampyrus, *Geoff.* Vampire.—Tail none, interfemoral membrane large, with 3 diverging lines, truncated at the end; muzzle long; central upper cutting teeth lobed.

Pale Vampyre. Vampyrus spectrum, *Leach.*—Phyllostoma spectrum, *Geoff.* Ann. Mus. xv. t. ii. f. 4; head and skull. Dict. de Sc. Nat. Vesp. spectrum, *Linn. Seba*, i. t. 58, f. 1, cop. *Schreb.* t. 54, *Shaw*, t. 43. Vampyrus sanguisuga, *Lesson*; front of lower lip with 2 small smooth warts in front. Inhabits Brazils. British Museum.

4. Phyllostoma, *Geoff.* Phyllostome. Vampyrus, *Spix.* Tail very short, on the upper side of the interfemoral membrane tips.

* *Front of the lower lip with a triangular space, having a large wart on each side and a series on the edge.*

Javelin Phyllostome. Phyllostoma hastatum, *Geoff.* Ann. Mus. xv. t. ii. Phyllostomus maximus, *Pr. Max.* Abbild. t. 71. Vesp. hastatus, *Pall.* Le Chauve-souris fer de lance, *Buff.* H.N. xiii. t. 33, cop. *Schreb.* t. 46. Encyc. Meth. t. 30. f. 4. Vesp. perspicillatus, *Schreb.* t 46, a. Pteropus hastatus, *Erxleb.* Javelin Bat, *Penn*, t. 30, fig. 4. Variable in colour, hair brown, tipt with gray. 1. male, fulvous brown; 2. female, brown; 3. male, blackish. Inhabits Brazil. British Museum.

See also Phyllostoma elongatum, *Geoff.* Ann. Mus. xv. t. 6. f.—Phyllostoma crenulatum, *Geoff.* Ann. Mus. xv. t. 6, f. *Desm.* Nouv. Dict. xxvi. t. m. 28, f. 3. Encyc. Meth. t. 3, f. 10. Inhabits ——?

Sooty Phyllostome. Phyllostoma fuliginosum, *Gray.*—Sooty-black, hair of head and neck with greyish tips, beneath greyer; nose-leaf ovate-lanceolate, quite entire, 1½ as long again as broad; ears sharp; wings black; tail end free. Inhabits S. America. British Museum. From Sir Everard Home.

* * *Lower lip with an half ovate group of crowded warts.*

Children's Phyllostome. Phyllostoma Childreni, *Gray.*—Brown, slightly grizzled, with grey tips to the hairs, beneath greyer; ears large with rather membranaceous rounded at the ends; nose-leaf ovate-lanceolate, rather longer than wide; wings brown; warts of lower lip in 3 or 4 arched series, crowded. Expanse 12″. Inhabits S. America. British Museum. From J. G. Children, Esq.

* * * *Front of lower lip with a small smooth ovate space formed of two small tubercles, as in Vampyrus.*

Bennett's Phyllostome. Phyllostoma Bennettii, *Gray.*—Fulvous brown, rather paler beneath; hair very long, soft, with greenish tips; ears very large, rather acute; nose-leaf very large, ovate-lanceolate, with a thick convex midrib; wings brown. Exp. 12″; nose-leaf 8‴. Inhabits S. America. British Museum. Named in memory of my excellent friend, whose early death all zoologists must deplore.

* * * * *Front of the lower lip with a large central wart, having a series of large oblong transverse warts on the edge, the upper warts sometimes divided into* 2 *or* 3.

Soricine Phyllostome. Phyllostoma soricinum, *Fischer.* Vampyrus soricinus, *Spix*, Braz. t. 36, f. 2–6. Inhabits Brazils.

5. Carollia. Interfemoral membrane large, truncated; tail none; tragus very small.

Brazilian short-eared bat. Carollia Braziliensis. Phyllostoma brachyotum, Pr. Max. t. f. 1–2. Inhabits Brazils.

6. Lophostoma, *Orb.* Interfemoral membrane large, truncated; tail rudimentary; tragus entire.

Lophostoma sylvicola, *Orbigny*, Voy. Amer. Merid. t. 6. Inhabits S. America. Perhaps the same as the former.

7. Edostoma, *Orbigny.* Edostome. Tail none; interfemoral membrane very small, marginal; heel-bone none; nose-leaf double, erect, anterior pierced with the nostrils, hinder erect, larger, separated from the front one by a considerable space.

Ashy Edostome. Edostoma cinerea, *Orbigny*, Voy. Amer. Merid, t. 8.

8. Macrophyllum, *Gray.* Macrophylle. Tail elongated, reaching to the truncated tip of the large interfemoral membrane, under lips ——?

Prince Nieuwied's Macrophylle. Macrophyllum Nieuwiedii, *Gray.* Phyllostoma macrophyllum, *Pr. Max. Abbild.* t. Inhabits Brazil.

9. Brachyphylla, *Gray.* Cavern Bat. Tail very short, interfemoral membrane deeply nicked, two rayed; nose-leaf small, surrounded by a deep groove, which separates it from the face; front of under lip with a smooth triangular space bearded on the edge.

Cavern Bat. Brachyphylla cavernarum, *Gray*, Proc. Zool. Soc. ii. 123. Inhabits St Vincents (West Indies.) Brit. Mus. and Zool. Soc. Mus.

10. Diphylla, *Spix.* Tail none; interfemoral membrane none; nose-leaf double, one being placed behind the other; tragus lanceolate; under lip ——?

Diphylla ecaudata, *Spix*, Braz. t. 36, f. 7. Glossophaga diphylla, *Fischer.* Inhabits Brazils.

11. Stenoderma, *Geoff.* Desmodus, *Pr. Max.?* Tail and interfemoral membrane none; nose-leaf very small, scarcely elevated; nostrils with an arched ridge behind; thumb long, free; under lip ——?

Stenoderma rufum, *Geoff.* Dict. Sc. Nat. t. Inhabits Brazils. Mus. Paris, (bad state.) Is the Desmodus rufus, *Pr. Max.* Abbild. t. Rhinolophus ecaudatus, *Schinz.* distinct? Temminck considers this to be a young *Dysopes*!

† † † *Forehead simple; ears lateral; tongue long, fitting into the notch of the chin; lower lip deeply cut in the centre of the front, and often fringed; head elongated; chin with reflexed whiskers.* New World.

12. Phyllophora, *Gray.* Tail short; apex enclosed in the large truncated interfemoral membrane; apex superior.

Phyllophora amplexicaudata, *Gray*. Glossophaga amplexicaudata, *Spix*. Braz. t. 36, f. 4. Inhabits Brazils. British Museum.

13. Glossophaga, *Geoff*. Tail none ; interfemoral membrane is large and deeply cut out.

Soricine Bloodsucker, Glossophaga soricina, *Geoff*. Vespertilio soricinus, *Pall*. Misc. t. 5. Spic. Zool. iii. t. 3–4, cop. *Schreb*. t. 47 ; and Encyc. Meth. t. 32. f. 5. *Edwards'* Birds, t. 201, f. 1. Pteropus soricinus, *Erxleb*. Phyllost. soricinum, *Geoff*. Ann. Mus. xv. t. 2. Leaf-bat, *Pennant*. Inhabits West Indies. British Museum, from Thomas Bell, Esq.

14. Monophyllus, *Leach*. Tail short, prominent above the very small deeply cut interfemoral membrane ; thumb elongated, thick ; heel-bone rather elongated ; head short,

Redmann's leaf-nose bat. Monophyllus Redmanni, *Leach*, Linn. Trans. xiii. 76. Brown, beneath rather paler ; membrane black ; lower lip fringed, and with two slight tubercles in front. Inhabits Jamaica.

Glossophaga caudifera, *Geoff*. Mem. Mus. iv. t. 17, cop. in Dict. Sc. Nat ; may not be different from the former.

15. Anoura, *Gray*. Tail-less Bat. Tail none, interfemoral membrane small, just margining the hind legs ; heel bone very short ; cutting teeth $\frac{2 \cdot 2}{0}$; thumb very small and slender.

Geoffroy's tail-less bat. Anoura Geoffroyi, *Gray*. Glossophaga ecaudata, *Geoff*. Mem. Mus. iv. t. 181. *Pr. Max*. Abbild. Inhabits Brazil. British Museum.

† † † † *Forehead simple ; ears large, united over the forehead.*

16. Megaderma, *Geoff*. Broad-winged bat. Nose-leaf simple, erect, front part flat, on the nose behind ; lips simple ; wings, interfemoral membranes and ears, large, membranaceous ; tail none ; cutting teeth $\frac{0}{0}$. India.

Megaderma trifolium, *Geoff*. Ann. Mus. xv. t. 12, head. Megaderma spasma, *Geoff*. Ann. Mus. xv. t. 12, from Vesp. spasma, *Linn*. from Seba, i. t. 56. f. 1. cop. *Schreb*. t. 48. *Shaw's* Zoology, t. 41. Vesp. lanceolata, *Deschamp*, MSS. Inhabits Java. Museum Leyden.

Lyre-nosed broad-winged bat. Megaderma Lyra, *Geoff*. Ann. Mus. xv. t. 12. cop. Encycl. Meth. t. 3. f. 11. B. Dict. Sc. Nat. Inhabits India. British Museum.

17. Lavia, *Gray*. Nose-leaf simple, erect behind, with an expanded elevated edge in front, and a fold forming a canal in the upper edge of its centre ; lips simple ; tail none ; cutting teeth $\frac{2}{0}$. Africa.

Lavia frons, *Gray*. Megaderma frons, *Geoff*. Ann. Mus. xv.

t. 1, head: la Feuille, *Daubenton,* Acad. Paris, 1769. Inhabits Africa, (Egypt, Senegal, Gambia.) British Museum.

Nose-leaf large, membranaceous, hairy, the hinder part elongated, with a deep fold on each side forming a broad central tapering kind of midrib, the lower part of each fold furnished with a membranaceous expansion covering the nostrils. The front of the leaf large, with a broad expanded free edge, furnished with a fold in centre of the front, forming a conical canal.

? 18. Mormoops, *Leach.* not *F. Cuv.* Nose-leaf simple; ears large, close together in front, united to the nose-leaf above, and to the membranaceous ridges round the mouth and chin; interfemoral membrane large, truncated; tail short, inclosed; apex free above; cutting teeth $\frac{4}{4}$.

Mormoops Blainvillii, *Leach,* Linn. Trans. xiii. t. 7. Inhabits Jamaica.

The genus described by M. F. Cuvier under this name appears to be perfectly different. This genus differs from *Vampyrus* in the large ears, the mouth being fringed with membranes, wartiness of the chin, and in the under lip being entire in front.

Tribe II.—Rhinolophina.

Nose disk expanded into a leaf behind, and with a pit or process between the nostrils in front.

* *Interfemoral membranes very small; tail none; disk with a large deep pit between the nostrils.*

19. Ariteus, *Gray.* Istiophorus, *Gray* (not *Cuv.*) Nose-leaf erect, lanceolate, simple behind, rounded in front; ears lateral; separate tragus; lanceolate-toothed; interfemoral membrane only margining the legs; heel-bone, moderate.

Yellowish Ariteus. Ariteus flavescens, *Gray.* Istiophorus flavescens, *Gray.* Zool. Misc. 37. Inhabits —— ? British Museum.

* * *Interfemoral membranes large; tail long.* (Old World.)

20. Rhinolophus (Noctilio, *Bechst.*) Horse-shoe Bat. Nose-leaf thin, extended into a transverse lanceolate leaf, with 4 cells at its base, and with a toothed longitudinal crest in the middle space, between the nostrils in front, and a slight pit in its front; ears large, separate; pubes with distinct false teats. Tragus small.

Rhinolophus hipposideros, *Geoff. Leach.* Misc. t. 121. Rh. bihastatus, *Geoff.* Ann. Mus. xx. t. 5. *Temm.* Mon. n. Vesp. minutus, *Montagu,* Linn. Trans. ix. t. 18, f. 6. Noctilio hipposideros *Bechst.* (1801.) V. ferrum-equinum β *Gmel.* Petit fer a cheval. *Daubent. Buffon,* N.H. iii. t. 20. Inhabits Europe. Brit. Mus.

Rhinolophus ferrum-equinum, *Leach,* Zool. Misc. Vesp. ferrum-equinum, *Schreb.* t. 62, upper fig. Vesp. hippocrepis, *Hermann.* Noctilio ferum-equinum, *Bechst.* Grand fer a cheval. *Daubent.* Mem. Acad. Paris, 1759, t. 1. f. 4. *Buffon,* N.H. viii. t. 17. f. 2. Rhinolophus unihastatus, *Geoff.* Ann. Mus. xx. t. 5. *Temm.* Mon. No. 13. Inhabits Europe, Asia, and Africa. (Britain, Turkey, Syria.) British Museum.

Rhinolophus megaphyllus, *Gray,* Proc. Zool. Soc. iii. 52. Inhabits New Holland. British Museum.

See also 1. Rhinolophus minor, *Horsf.* Java, t. f. *a, b,* head. *Temm.* Mon. No. 14. 2. Raffinis, *Horsf.* Inhabits Java. Museum, India House; and 3. Rhinolophus griseus, *Meyer.* Bonn. Trans. 1824. Inhabits —— ?

Rhinolophus Capensis, *Licht.* Rhinolophus clivosus, *Ruppell.* Atlas, t. 18. *Temm.* Mon. No. 15. Rhinolophus Geoffroyi, *A. Smith,* Zool. Journ. Inhabits Africa, (Egypt, Cape of Good Hope,) and Europe, (Dalmatia, Sicily,) Asia, (Levant.) British Museum.

21. Hipposideros, *Gray.* Phyllorhina, *Bonap.* The nose disk extended into a short reflexed leaf behind, with a thick cross rib on the front of its base, to which it is attached by 3 longitudinal bands, the front part flat, simple, pierced with the nostrils. Tragus none.

a. Forehead pierced with an expansile pore; pubal teats distinct.

** Face leafy on the sides of the nose disk.*

Hipposideros insignis. *Gray.* Rhinolophus insignis, *Horsf.* Java, head. *Temm.* Mon. No. 3, t. 1, f. 2. Vesp. cyclope, *Desch.* MSS. Ears acute, front, with a narrow and a broad hairy band; tail end not produced. Inhabits Java. Museum, India House.

Dr Horsfield's specimen of Rhin. deformis, (t. 7, f. 9, head,) appears to be a specimen of this species, the base of the tail of which has been drawn out when the animal was skinned.

Hipposideros apiculatus, *Gray.* Ears acute, front edge hairy, hinder edge plicated; last joint of the tail elongated and produced; fur soft, silky; base whitish; tips dark-brown. Inhabits India. W. Elliot, Esq. British Museum.

** * Face not leafy on the sides of the nose disk.*

Hipposideros fulvus, *Gray.* Fur reddish fulvous; silky, rather paler beneath; ears very large, rounded, dark, with a few short scattered hairs on the outsides, and 2 or 3 lines of long hairs on the front edge; last joint of tail slightly produced. Inhabits India, (Madras.) W. Elliot, Esq. British Museum.

Mouse-coloured Horse-shoe-Bat. Hipposideros murinus, *Gray.*

Fur pale mouse-colour, hairs with brown ends, and very small white tips; whitish beneath; ears very large, rounded, with 2 or 3 lines of long hairs on the front edge; tail, last joint slightly produced. Inhabits India, (Madras.) W. Elliot, Esq. British Museum.

This difference of colour is not sexual, as Mr Elliot had male and female of each. See also Rhinolophus armiger, *Hodgs.* from Nepaul.

b. Forehead concave, deep, with a tuft of rigid brown hair in the front, in the place of the frontal pore; (tail destroyed;) sides of face leafy.

Pencilled Horse-shoe Bat, Hipposideros penicillatus, *Gray.* Brown, with a tuft of brown hair on each side over the eyes, and a small pencil of rigid brown ones on the front of the forehead. Inhabits India, (Madras.) W. Elliot, Esq.

c. Forehead simple; nose leaf entire, rounded; tail as long as the membrane; muzzle leafy on side of nose disk. (India.)

Hipposideros diadema, *Gray.* Rhinolophus diadema, *Geoff.* Ann. Mus. xx. t. 5. *Temm.* Mon. n. 2. Inhabits Timor.

Hipposideros nobilis, *Gray.* Rhinoloph. nobilis, *Horsf.* Java, Head from dry specimen, *Temm.* Mon. No. 1, t. 1, f. 1. Inhabits Java. Museum, India House.

Hipposideros larvatus, *Gray.* Rhinolophus larvatus, *Horsf.* Java, head. *Temm.* Mon. No. 9. Inhabits Java. Museum, India House.

Hipposideros vulgaris, Rhinolophus vulgaris, *Horsf.* Java, t. 7. f. E. head. Inhabits India. British Museum. Museum, India House.

See also Rhinolophus Commersonii, *Geoff.* Ann. Mus. xx. t. 5, head. Only known from Commerson's drawings; tail half as long as the thigh. Inhabits Madagascar. See also R. torquatus, *Hodgs.* of Nepal.

d. Forehead simple; nose leaf 3-toothed; tail longer than membrane; pubal teats none. Asellia.—*Gray.*

Three-toothed Horse-shoe Bat. Hipposideros tridens, *Gray.* Rhinolophus tridens, *Geoff.* Descrip. Egypte, t. 2, in Ann. Mus. xx. t. 5, head. Dict. Sc. Nat. *Temm.* Monog. No. 6. Cheeks with longitudinal ridges. Inhabits North Africa, (Egypt.) British Museum.

The difference in the form of the front part of the nose-leaf, on which Dr Horsfield founded part of his specific character, appears to depend on the drying of the specimens. All the specimens described by that excellent zoologist were in a dry state. I have made the foregoing references to his species after the examination of

his own specimens in the India House, and those which he sent to the British Museum as types of his species.

B. Anistiophori, *or Simple nosed bats. Nostrils simply pierced in the end of the muzzle without any nasal leaf.*

Tribe III.—Vespertilionina.

Grinders acutely tubercular, wings broad, large; tail elongated, as long as, and enclosed in, the large conical interfemoral membrane, upper cutting teeth near the canines, with a central space.

† *Ears united or approximate; nostrils each placed in the front of a groove, the grooves are close together in front, diverging from one another behind, and are covered by their spirally convolute outer margin, which is lobed in front for the passage of the air.*

22. Nycteris, *Geoff.* Ears large, united over the forehead; tragus distinct; wings and interfemoral membrane large; tail long, forked at the tip.

* *Ears united on the forehead.* Africa.

Nycteris Thebaica, *Geoff.* Descript. Egypte, t. 1, No 2. Ann. Mus. xx. t. 1, head. Vespert. hispidus, *Schreb.*? Nyct. Geoffroyii, *Temm.* Inhabits Africa. (Egypt and Guinea?) Brit. Mus.

Add also 1. Nycteris Capensis, *A. Smith,* Zool. Journ. iv. and 2. Nycteris affinis, *A. Smith,* Zool. Journ. iv. Inhabits Africa. (C. G. H.)

* * *Ears not united in front, forehead with a large deep oval naked concave pit, having a naked groove in front running down between the nostrils.* Asia. (Petalia, *Gray.*)

Nycteris Javanica, *Geoff.* Ann. Mus. xx. t. 1. N. Kuhlii, *Temm.* Vesp. policaris, *Deschamps.* Inhabits Java. Mus. Ind. House.

† † *Ears united; nostrils in the front part of a short lunate groove.*

23. Nyctophilus, *Leach*? *Temm.* Barbastellus, *Gray.* Nose grooves united together behind by an elevated membranaceous crest, extending across the nose; forehead bare with a central longitudinal furrow having inflexed bald edges.

Australian Nyctophile. Nyctophilus Geoffroyii, *Leach.* Linn. Trans. xiii. 78? *Temm.* Vy. (1833.) Barbastellus Pacificus, *Gray.* Zool. Misc. (1831) 38. Inhabits Pacific Islands. Mus. Brit. and Linn. Soc. Mus.

24. Barbastellus, *Gray.* Nasal groove simple lunate, extending a short distance behind the nostrils; forehead flat with an oval bald longitudinal line; ears large, broad, subquadrate; skull convex; face narrow.

Common Barbastelle. Barbastellus communis, *Gray*, B. Daubentonii, *Bell.* Plecotus barbastellus, *Lesson.* Vesp. barbastellus, *Schreb.* Barbastelle, *Daubent.* Mem. Acad. Paris, 1759, t. 2. f. 8. *Buffon*, H.N. viii. t. 19, f. 1, copied, *Schreb.* t. 559, Encycl. Meth. t. 38. f. 6. *Geoffroy*, Ann. Mus. viii. t. 46. 48. Europe. Brit. Mus.

25. Plecotus, *Geoff.* Nasal groove simple, lunate; forehead with a linear bald streak; forehead flat; ears and tragus very large, elongate.

Common long-eared bat, Plecotus communis, *Lesson.* Plecotus auritus, *Geoff.* Vesp. auritus, *Linn.* Oreillard, *Daubent.* Mem. Acad. Paris, 1759, f. 1. and 2 (head). *Buffon.* H.N. viii. t. 17. f. 1, cop. *Schreb.* t. 50, and Encycl. Meth. t. 83, f. 1. *Geoff.* Ann. Mus. viii. t. 47 head. *Edwards'* Birds, t. 201. *Penn.* B. Zool. t. 103. *Shaw's* Zool. t. 40. Young, Plecotus brevimanus, *Jenyns*, Linn. Trans. xvi. t. 1, f. 2 ♀. Europe. Var. α. Egyptiacus, *Geoff.* β. Austriacus, *Desm.* Brit. Mus.

See also 1. Plecotus cornutus, *Lesson.* Vesp. cornutus, *Faber*, Isis 1826. Inhabits Jutland. 2. P. Bonapartii, P. brevimanus, *Bonap.* 3. Plecotus Peronii, *Isidore St Hilaire*, Mag. Zool. t. 3, f. 1. Inhabits——? 4. Plecotus leucomelas, *Ruppell*, Atlas t. 28 b. Inhabits N. Africa. 5. P. Macrotis, *Le Conte.*

Christie's long-eared bat, Plecotus Christii, n. s. Fur pale, hairs whitish with dusky tips; beneath white; spur very long; interfemoral membrane with 11 or 12 cross lines of vessels on the back of the thigh and skin; tragus half as long as the ears. Inhabits N. Africa. Dr Turnbull Christie. British Museum.

† † † *Ears lateral, separate; nostrils in the front of a long simple edged groove.*

26. Romicia, *Gray.*—Nostrils small, ovate, apical; each in the front of a converging groove, which are united behind into a groove on the centre of the nose between the swollen cheeks.

Long-spurred Romicia, Romicia calcarata, *Gray.*—Chin with two small warts on each side, and a large one on the front part of the throat; fur brown with grey tips; the tips of the hair on the under side longer and whiter, tragus elongated, oblong, blunt; ears rounded; wings black; interfemoral membrane with regular muscular bands; heel-bones very long, two-thirds the length of the margin, with a lobe on the outer edge of the base; the other third of the margin with a strong muscular band. Inhabits ——? British Museum.

† † † † *Ears lateral separate; nostrils with only a very short nasal groove behind them.*

27. Vespertilio. Head round; forehead convex; face small, pro-

duced, nearly covered with hair; wings and ears thin, membranaceous; body covered with woolly hairs; tail long, the whole length of the interfemoral membrane, cutting-teeth $\frac{2\cdot2}{4}$; skull globular; jaws produced, narrow; eyes large, exposed.

† *Thumb moderate; ears short.*

Vesp. mystacinus, *Leisl.* (Kuhl. l. c.) Europe. British Museum.

Vesp. Nattereri, *Kuhl.* Wetter. Ann. iv. t. 2, 3, (head.) Inhabits Europe, (London.) British Museum.

Vesp. Daubentonii, *Kuhl.* Wetter. Ann. iv. t. 25, f. 1, head. Inhabits Europe. British Museum.

Hardwicke's bat, Vespertilio Hardwickii, *Horsf.* Inhabits Java. British Museum. East India Company.

Painted bat, Vespertilio pictus, *Pallas.* V. kerivoula, *Bodd.* Inhabits Java (and Ceylon.) British Museum. East India Company.

See also 1. V. fuliginosa, *Hodgs.* 2. V. capaccini, *Bonap.* 3. V. emarginatus, *Brong.*

* * *Thumb moderate; ears large.*

Large eared bat, Vespertilio myotis, *Bechst.*—Vesp. murinus, *Geoff.* Ann. Mus. viii. t. 47 and 48, (not Linn.) *Daubenton,* Mem. Acad. 1759, t. 1, f. 1. *Buffon,* H.N. viii. t. 16, cop. Encycl. Meth. t. 38, f, 2. Jun. Vesp. murinus, *Bechst.* var. Vesp. submurinus, *Brehm.* Inhabits S. of Europe, ("not found in Sweden," *Nilsson.*)

* * * *Thumb very long.*

Vesp. Bechsteinii, *Leisl. Kuhl.* Wetter, Ann. iv. t. 22, f. Inhabits Europe.

* * * * *Thumb moderate, end of tail rather produced.*

Vesp. Capensis, *Smith,* Zool. Journ. iv. Inhabits Cape of Good Hope. M. Jourdan.

28. Furia, *Fr. Cuv. Furipterus,* Bonap.—Head round; forehead compressed, convex; face small, broad, produced, nearly covered with hair; wings and ears thin membranaceous; tail bony for half its length, cartilaginous at tip, cutting teeth $\frac{4}{6}$, upper acute.

Furia horrens, *Fr. Cuv.* Mem. Mus. xvi. t. 9. Vesp. Furia, *Fischer.* Inhabits S. America. Does not the peculiarity of the tail arise from the bones having been partly withdrawn when the animal was skinned?

29. Natalus, *Gray.* Head small; face depressed; nostrils apical, ovate, separated by a central ridge; lower lip callous, grooved; hind legs and tail very long; the heel-bone extending the whole length of the interfemoral membrane.

Natalus stramineus. Vesp. longicaudatus, *Gray,* MSS. Fur pale yellow-brown; paler beneath. Inhabits—? British Museum.

30. Miniopterus, *Bonap.* 1837. Head subglobose ; forehead convex ; face short ; ears small, thick, rounded ; tragus lunate ; eyes partly hid ; feet long ; tail very long ; interfemoral membrane very large, folded on each side

Miniopterus Ursinii, *Ch. Bonap.* Fauna Ital. Italy, and M. Sciboldii, Japan. Museum, Leyden.

31. Scotophilus, *Leach.* Nycticejus, *Rafin ? Horsf.* Pipistrellus, *Bonap.* V. Pachyote, *Gloger.* Head oblong ; forehead flat ; face swollen on the sides, naked in front ; wings and ears thick, rather coriaceous ; body covered with short fine adpressed thick-set hairs ; cutting teeth $\frac{2}{6}\frac{2}{2}$, when young $\frac{1}{6}\frac{1}{1}$; when adult ; skull flat above ; forehead shelving ; eyes small, hid in the fur.

The genus Nycticejus, *Rafinesque,* from an old specimen, as Scotophilus, *Leach,* is from a young specimen of this genus ; Nyctalus, *Bowdich,* is only a species with ticks in its ears, and interfemoral membrane nearly bald.

Common bat. *Penn.* Scotophilus murinus, *Gray.* Vespertilio Pipistrellus, *Schreb.* V. murinus, *Linn.* Junior, Vesp. pygmæus, *Leach.* Zool. Journal, iii. Inhabits Europe. Colour variable. *Leach's* specimen of *V. pygmæus* is so young that the bones of the skull are neither united nor hardened, and the epiphyses are visible in all the joints.

Serotine Scotophile, Scotophilus serotinus, *Gray.* Vesp. Serotinus, *Schreb.* V. noctula, *Geoff.* Ann. Mus. viii. t. 47, 48 head. Le Serotine, *Daubenton,* Acad. Par. 1759, t. 2, f. 2. *Buffon,* HN. viii. t. 18, f. 2. cop. *Schreb.* t. 53, and Encycl. Meth. t. 23, f. 4. Serotine bat, *Pennt.* Inhabits Europe.

Scotophilus Noctula, *Gray.* Vesp. Noctula, *Schreb.* t. 52. *Fr. Cuv.* Mam. Lith.—var. Sumatrana, *Fr. Cuv.* Inhabits Europe. Brit. Mus.

Scotophilus Kuhlii, *Gray.* Vesp. Kuhlii, *Natterer. Kuhl.* l. c. Inhabits Europe.

Scotophilus Leisleri, *Gray.* Vesp. Leisleri, *Kuhl.* V. dasycarpos, *Leisl.* MSS. Inhabits Europe.

Scotophilus discolor, *Gray.* Vesp. discolor, *Kuhl.* Wett. Annal. iv. t. 25, f. 2. Inhabits Europe (Bucharia.)

Scotophilus Schreibersii, *Gray.* Vesp. Schreibersii, *Kuhl.* Inhabits Europe.

Scotophilus Leachii, *Gray.* Scotophilus. Kuhlii, *Leach,* Linn. Trans. xiii. 72. (Young) male chesnut, female brown. Inhabits —— ? British Museum.

Scotophilus Temminckii, *Gray.* Vesp. Temminckii, *Horsf.*

(Young) Vesp. Belangeri, *Isid. Geoff. Belanger,* Voy. adult. Inhabits India. E. India Company.

Scotophilus castaneus, *Gray.* Vesp. castaneus, *Gray.* Illustr. Ind. Zool. Inhabits India. General Hardwicke.

Scotophilus Heathii, *Gray.* Nycticejus Heathii, *Horsf.* Proc. Zool. Soc. 114. Inhabits India, (Madras.) Mus. Zool. Soc. Probably only a variety of Scotophilus Leachii ?

Scotophilus Javanicus, *Gray.* Vesp. Javanica, *Fr. Cuv.* Nouv. Ann. Mus. 1. 21. Inhabits Java.

Scotophilus Coromandra, *Gray.*—Vesp. Coromandra, *Fr. Cuv.* Nouv. Ann. Mus. i. 21. Inhabits India. Vesp. formosa, *Hodgs.* Inhabits Nepaul. (If it is not Scot. Leachii, *Leach.*)

See also 1. Vesp. Alcitoe ; 2. V. Leucippe ; 3. V. Aristippe ; 4. V. Savi, and 5. V. Vispistrellus, *Bonap.* ; Fauna Ital.

** *Upper surface of interfemoral membrane slightly covered with hair.*

(Pachyotus.)

† *Face villose.*

Scotophilus polythrix. Vesp. polythrix, *Isid. Geoff.* Ann. Sc. Nat. iii. 443.

† † *Face partly bald.*

Scotophilus lævis, *Isid. Geoff.* Ann. Sc. Nat. iii. 443.

* * *Upper surface of interfemoral membrane covered with close hairs*

Lasiurus—Atalapha, *Rafin.* ?

Scotophilus pruinosus. Vesp. pruinosus, *Say,* Long's Exp. 167. Inhabits N. America, (River Missouri.) British Museum.

Scotophilus lasiurus, *Gray,*—Vesp. lasiurus, *Schreb.* t. 62, B. cop. Encyc. Meth. t. 31, f. 4, *Geoff.* Ann. Mus. viii. t. 47, head. Inhabits Cayenne.

Scotophilus Blossevilii. Vesp. Bonariensis, Voy. Coquille, t. 2, f. 1. Vesp. Blossevilii, *Lesson,* Bull. Sc. Nat. viii. 95. Inhabits S. America (La Plata.)

See also, Scotophilus Noveboracensis. New York bat, *Penn.* Syn. t. 31, f. 2, cop. Encyc. Meth. t. 34, f. 5. Atalapha Americana, *Rafin.* Vesp. Noveboracensis, *Erxleb.* Doubtless belong to this section, but want further examination.

Tribe IV. Noctilionina.

Grinders acutely tubercular ; wings long and narrow ; body thin ; tail thick.

* *Tail short, tip on the upper surface of the large interfemoral membrane.*

32. Taphozous, *Geoff.* Saccopteryx, *Illiger.* Head conical, de-

pressed; forehead with a large pit; cutting-teeth, $\frac{2}{4}$; throat of males with a transverse slit. Inhabits Old World.

Taphozous perforatus, *Geoff.* Descript. Egypte, t. 3. f. 1. Dict. Hist. Nat. t. T. Senegalensis, *Geoff.* (dry ?) from Lerot Volant, *Daubenton.* Tail rather longly produced. Inhabits Africa, Egypt. British Museum.

Taphozous lepturus, *Geoff.* Saccopteryx lepturus, *Illiger,* from Vesp. lepturus, *Schreb.* t. 57. Vesp. marsupialis, *Müller,* Naturf. 19. Said to come from Surinam; scarcely appears to differ from the former.

Taphozous nudiventer, *Rüppell.* Atlas, t. 27. Inhabits Africa (Nubia) Dr Rüppell. British Museum.

Taphozous rufus, *Harlan,* from the Red bat, *Wilson.* (Am. Orn. vi. t. 50. f. 4.) is a *Scotophilus* from the manner in which it bends its tail, perhaps *Scot. pruniosus.*

33. Noctilio, *Linn.* Celaeno, *Leach.* Head conical; forehead flat; muzzle acute warty; lips dependent; cutting-teeth, $\frac{1}{2}$ young, $\frac{2}{2}$ adult. America.

The genus *Celaeno* of *Leach* is only a specimen in which the bones of the tail have been withdrawn out of the skin. The original specimen is in the museum of the University College, London.

Noctilio Americanus, *Linn.* N. unicolor, *Pr. Max.* Vesp. leporinus, *Linn., Schreb.* t. 60. *Seba,* t. 55, f. 1. Peruvian Bat, *Penn.* Inhabits South America.

Noctilio mastivus. Vesp. mastivus, *Vahl.* Selsk. Skriv. iv. t. 132, f. 7. (1797.) Noctilio dorsatus, *Pr. Max.* Beitr. N. vittatus, *Pr. Max.* Abbild. t. Pteropus leporinus, *Erxleb.* Jun. N. albiventer, *Spix,* Braz. t. 36. f. 2. *Desm.* Mamm. Inhabits South America. British Museum.

? Noctilio rufus, *Spix,* Brazil, t. 35, f. 1. Inhabits S. America.

34. Proboscidea, *Spix.* Embalanura, *Kuhl.* Head long, conical; muzzle sharp, produced; forehead flat; upper jaw longest; cutting teeth $\frac{2}{6}\div\frac{2}{2}$.

* *Interfemoral membrane truncated.* (Proboscidea, *Spix.*)

Proboscidea saxatilis, *Spix,* Braz. t. 35, f. 8, bad. Vesp. naso, *Pr. Max.* Abbild. t. Embalonura saxatilis? *Temm.*?

Proboscidea rivalis, *Spix,* Braz. Inhabits Brazils.

Proboscidea canina. Vesp. caninus, *Pr. Max.* Abbild. t. Inhabits Brazils.

* * *Interfemoral membrane produced conical; heel-bone very long,* Centro nycteris.

Proboscidea calcarata. Vesp. calcaratus, *Pr. Max.* Abbild. t. Vesp. Maximiliani, *Fischer.* Inhabits Brazils.

* * * *Interfemoral membranes, &c.*——— ? (Embalanura, *Kuhl.*)

Proboscidea monticola. Embalanura monticola, *Kuhl.* Face depressed ; forehead rounded ; wings brown ; expanse 6 inches ; heel-bone 4 lines. Inhabits Java. Museum, Leyden.

35. Aello, *Leach.* Head subconic ; forehead flat ; ears large, separate ; cutting-teeth $\frac{2}{4}$; upper, chisel-shaped, 2 cut ; tail rather elongated with a membranous band to the tip of the large truncated interfemoral membrane ; heel-bone very slender.

Aello Cuvieri, *Leach.* Linn. Trans. xiii. 71. Inhabits ——— ? Museum University College of London.

† † *Tail produced beyond the bend of conical interfemoral membrane.*

36. Pteronotus, *Gray.* Ears lateral ; tragus elongate lobed ; chin with a reflexed cartilaginous edge to the lower lip, and an erect membranaceous ridge across its lower part ; wings only affixed by a narrow line to the middle of the back, which is covered with fur beneath them ; hind-feet long ; the ankle rather produced and exposed ; the lower angle of the wing lies folded over it.

Pteronotus Davyi, *Gray.* Mouse-coloured, wings baldish ; exp. 12 inches. Inhabits Trinidad. Museum Fort Pit, Chatham. Tail imperfect. In honour of Dr John Davy, so well known for his physiological papers.

† † † *Tail thick, produced beyond the end of the short transversely-folded interfemoral membrane ; thumb large, swollen beneath ; cutting-teeth very variable in number.*

37. Cheiromeles, *Horsf.* Dysopes, *Temm.* not *F. Cuv.* Ears small, separate, lateral ; back nearly naked ; great toe very large, versatile, bearded.

Collared-handed Bat. Cheiromeles torquatus, *Horsf.* Java, t. copied in Dysopes cheiropus, *Temm.* Mon. t. 7, and t. 23, f. 15. Molossus torquatus, *Fischer.* Molossus cheiropus, *Less.* Inhabits India, (Siam.) Museum, India House.

38. Nyctinomus, *Geoff.* Ears very large close together, or folded down on the forehead ; muzzle obliquely truncated, bristly ; lips very large, transversely grooved, and with scattered bristle-like hairs ; thumb and little toe with a patch of white tufted hairs.

Nyctinomus plicatus. Molossus plicatus, *Fischer.* Vesp. plicatus, *Buchanan,* Linn. Trans. v. t. 13. Dysopes plicatus, *Temm.* Nyctinomus tenuis, *Horsf.* Java t. (dry) cop. Dysopes tenuis, *Temm.* Mon. t. 19, 20, t. 23. f. 30. 16 skeletons. Nyctinomus Bengalensis, *Geoff.* Vesp. labiata, *Hodgs.* Dysopes labiatus, *Temm.* MSS. ? Nyctin. dilatatus, *Horsf.* Java. *Gray's* Illustr. Ind. Zool. 2. Molossus dilatatus, *Lesson.*

The upper edge of the nose disk surmounted by a series of short close processes ; face, with scattered flattened hairs, which are curv-

ed at the tip, some of them forming a tuft on the front of the lip; ears united in a common tubercle in front; the pad of the great and little toes narrow, hairs slender, long. Inhabits India (Bengal) Java. British Museum.

Nyctinomus Rüppelli. Dysopus Rüppelli, *Temm.* Mon. t. 18, t. 23, f. 6, 8. Molossus Rüppelli, *Lesson.* Upper lip with scattered straight black bristles, intermixed with flat hooked ones; pad of great and little toes very large. Inhabits Egypt and Fernando Po. British Museum.

Nyctinomus pumilus. Dysopes pumilus, *Rüppell,* Atlas, t. 27, a. Inhabits North Africa, (Egypt.) Dr Rüppell.

Nyctinomus murinus, *Gray,* Griff. A. K. v. 187. Molossus murinus, *Fischer.* Petit chauve-souris obscure, *Azara?* Face hairy, with black bristles; upper lip simple in front; ears round, separated at the base in front; tragus slender; pad of great and little toes large, broad. Inhabits South America, (Brazils;) West Indies, (Jamaica.) British Museum.

Nyctinomus nasutus. Molossus nasutus, *Spix,* Braz. t. 35, f. 7. Dysopes nasutus, *Temm.* Mon. t. 24, f. 2, 3. Nyctinomus Braziliensis, *I. Geoff.* Ann. Sc. Nat. 1. t. 22, f. i. cop. Zool. Journ. t.

39. Molossus, *Geoff.* Ears very large, close together and folded down on the forehead; face conical; nose rounded at the end; lips smooth or hairy; great and little toe with a pad of hooked hairs; throat with a central pouch in front; lower joint of thumb swollen.

Molossus velox, *Lesson.* Dysopus velox, *Temm.* Mon. t. 22. f. 1. t. 23, f. 22; upper lip with a roundish group of close slender hooked hairs in front; throat-pouch large. Inhabits Brazils, Cuba. British Museum.

Molossus fuliginosus. Face naked, black with a bunch of hairs on each side, just before the eyes; upper lip with a triangular patch of hooked white hairs in front; lips smooth, inner edge slightly fringed with rather stiff hairs in front; tragus long pointed; tail half free; nose-disk convex with denticulations on the edge, with a triangular bunch of hair below the nostril; end of face hairy; throat-pouch small. Inhabits ——? British Museum.

Molossus rufus, *Geoff.* Dysopes rufus, *Temm.* Mon. t. 23, f. 19. teeth. Dysop. perotis, *Pr. Max.* Abbild. t. . Upper lip with a narrow erect triangular group of hooked hairs between the nostrils; edge of the nose disk finely crenate; ears close together in front. Inhabits Brazils, Surinam. British Museum.

Molossus australis. Dark-brown, rather paler beneath, with a broad pure white streak down each side, between the wing and the body, and a narrow white streak round the edge of the rump beneath; ears large, broad, rounded; tail nearly one-half free. In-

habits New South Wales. (Major Macarthur.) United Service Museum.

40. THYROPTERA, *Spix.* Ears large, close together, and folded down over the forehead; lips thick; muzzle obliquely truncated; thumb thin, with a large rounded dilatation at the middle-joint; hind feet weak, small.

Thyroptera tricolor, *Spix,* Braz, t. 36, f. 1, evidently young. Black-brown above, beneath pale-white; wings and ears black. Inhabits Brazil.

41. MYOPTERIS, *Geoff.* Ears large, lateral; muzzle short and blunt; cutting teeth, $\frac{2}{2}$, upper pointed, close together.

Myopteris Daubentonii, *Geoff.* from Rat volant, *Daubenton,* Mem. Ac. Paris, 1759, 386. Inhabits N. America. Is it a Noctilio?

See also Nycticegus cynocephalus, *Le Conte.*

* * * *Tail very short, many-jointed, enclosed in a two-valved sheath, placed at the base of the extended interfemoral membrane.*

42. DICLIDURUS, *Pr. Max.*

Diclidurus Freyreissii, *Pr Max.* Isis, 1819. D. albus, *Pr. Max.* Abbild, t. Inhabits Brazils. Museum, Neuwied. Perhaps more allied to Vespertilionina.

TRIBE V.—PTEROPINA.

Grinders bluntly tubercular; nose simple; nostrils slightly produced; end of index finger-clawed; head conical; ears simple, lateral; tragus none; wings long; lower joint of thumb long, united to the wing by a membrane; interfemoral membrane short; tail none, or short; living on fruit in Indian islands and Polynesia.

43. Ternate Bat, PTEROPUS. Head long, conical; muzzle acute; grinders $\frac{5}{6}$ or $\frac{4}{6}$; tongue short; wings from the side of the body; tail none, or short.

* *Tail none; ears large.*

Black Ternate Bat, Pteropus edulis, *Pennt.* Pt. Javanicus, *Desm. Temm.* Mon. t. 15, f. 1. Pt. Edwardsii, *Geoff.?* Vesp. vampyrus, *Linn.* Vesp. Celaeno, *Herm. Seba,* t. 57, f. 2. Ternate Bat, *Pennt.* Var. Pt. Edwardsii, *Geoff.* Inhabits Java, Sumatra, Timor, Bengal?

Indian Ternate Bat, Pteropus medius, *Temm.* Inhabits India, (Calcutta, Pondicherry.)

* * *Tail none; ears small.*

Pale-faced Ternate Bat, Pteropus phaiops, *Temm.* Inhabits Madagascar.

Grey-headed Ternate Bat, Pteropus poliocephalus, *Temm.* Inhabits New Holland.

Red-necked Ternate Bat, Pteropus dasymallus, *Temm.* Mon. t. 10, t. 13, f. 10, 11, cran. Pteropus rubricollis, *Siebold*, not *Geoff.* Inhabits Japan.

Common Ternate Bat, Pteropus vulgaris, *Geoff.* Rousette, *Buff.* H. N. x. t. 14. cop. Vesp. caninus, *Schreb.* t. 44. Inhabits Isle of France, Bourbon, (Madagascar?)

Red-collared Ternate Bat. Pteropus rubricollis, *Geoff.* Pt. collaris, *Licht.* Vesp. Vampyrus β. *Erxleb.* Rousette, *Buff.* H. N. x. t. 17. Inhabits Cape of Good Hope, *Lichtenst.* Bourbon and Madagascar, *Temm.*

Pale Ternate Bat, Pteropus pallidus, *Temm.* Mon. t. 15, f. 8, 9. Inhabits Banda.

Keraudren's Ternate Bat, Pteropus Keraudrenii, *Quoy* and *Gaim.* Voy. Uran, t. 3. *Temm.* Mon. t. 15, f. 7. cran. Pt. Marianus, *Desm.* Inhabits Island of Guam. *Quoy* and *Gaimard.*

Amboyna Ternate Bat, Pteropus Dussumieri, *Isid. Geoff. Belanger,* Voy. 9, 8. Inhabits India and Amboyna.

Grey Ternate Bat, Pteropus griseus, *Geoff.* Ann. Mus. xv. t. 6. cop. *Temm.* Mon. t. 11. Inhabits Timor. *Pennt.*

Masked Ternate Bat, Pteropus personatus, *Temm.* Mon. 189. Inhabits Ternate Islands.

See also Pteropus leucocephalus, *Hodgson.* Inhabits Nepaul.

* * * *Tail very short.*

Pteropus Aegyptiacus, *Geoff.* Pteropus Geoffroyi, *Temm.* t. 15. f. 14, 15. Inhabits N. and E. Africa. *Dr Turnbull Christie.*

Pteropus Leachii, *A. Smith,* Zool. Journ. Inhabits Cape of Good Hope.

Pteropus stramineus, *Geoff.* Temm. Mon. 1, t. 15, f. 12, 13. Inhabits Timor.

* * * * *Tail rather elongated.* ($\frac{1}{2}$ inch.)

Pteropus Leschenaultii, *Desm.* Inhabits Pondicherry.

Pteropus amplexicaudatus, *Geoff.* Ann. Mus. xv. t. 7. Cop. Dict. Sc. Nat. t. and *Temm.* Mon. t. 13. t. 15, f. 16. Inhabits Timor, Amboyna, Sumatra, Siam. (C. Good Hope?)

44. Cynopterus, *F. Cuv.* Pachysoma, *Isid. Geoff.* Head short broad; lips thick on the sides; grinders $\frac{4}{5}$; tail short, free; wings from the side of the back.

Cynopterus marginatus, *Fr. Cuv.* Pteropus marginatus, *Geoff.* Ann. Mus. xvi. t. 8. cop. *Temm.* 1, t. 14. Inhabits India.

Cynopterus titthæcheilus. Pteropus titthæcheilus, *Temm.* Mon. t. 13, f. 17, 24. Pachysoma mammilevre, *Geoff.* Male with a tuft of hair on the side of the neck, white in young, reddish in adult. *Is. Geoff.*

Cynopterus brevicaudatus. Pachysoma brevicaudatum, *Is. Geoff*

Inhabits Sumatra. Tail very short. This and the next are probably varieties of the former.

Cynopterus Diardii. Pachysoma Diardii, *Is. Geoff.* Inhabits Sumatra.

Cynopterus Duvancellii. Pachysoma Duvancellii, *Is. Geoff.* Inhabits Sumatra. Thumb of wing elongated.

Cynopterus melanocephalus. Pteropus melanocephalus, *Temm.* Mon. t. 12, t. 18, f. 3, Scel. f. 4, teeth. Pachysoma melanocephalum, *I. Geoff.* Inhabits Java. Wings very short, rounded.

The Vespertilio Sphinx, *Vahl.* Natur. Selsk. Skriv. iv. 130, from Tranquebar, probably belongs to this genus.

45. Epomophorus, *Bennett.*—Head very large, muzzle acute long; grinders $\frac{5}{5}$ front lower small; tail none? wings far back.

a. *Tuft of white hair near the ears, and another on the sides of the body, false grinders* $\frac{3}{3}$.

Epomophorus Whitii. Pteropus Whitii, *Bennett,* Trans. Zool. Soct.—Pt. epomophorus, *Bennett,* Proc. Zool. Soc. Inhabits W. Africa.

b. *Tuft of white hairs at the base of the ears; head very long.*

Epomophorus macrocephalus. Pteropus macrocephalus, *Ogilby,* Proc. Zool. Soc. iii. 100. Pt. megacephalus, *Swains.* Lardn. Cycl. 92, p. 31 and 154. Inhabits W. Africa. British Museum.

c. *Tuft of white hairs at the front base of the wing, head moderately long.*

Epomophorus Gambianus. Pteropus Gambianus, *Ogilby,* l. c. W. Africa.

46. Macroglossa, *Lesson.* Macroglossum, *F. Cuv.* not *Fabr.* Head elongated; muzzle slender, subcylindrical; tongue long, slender, exsertile, smooth; wings from the sides of the back; live chiefly on the fruit of *Eugeniæ.*

Macroglossa minima. Pteropus minimus, *Geoff.* Pt. rostratus, *Horsf.* Java, t. *Temm.* Monog. t. 15, f. 25,30, t. 16, f. 1,2, M. kiodotes and M. Horsfieldii, *Lesson.* Inhabits Java, (Gen. Hardwicke.) British Museum. East India Company.

47. Harpyia, *Illiger.* not *Cuv.* Head short broad; lips thick; grinders ——? wings arising from the centre of the back; index-finger clawed; tail very short.

Harpyia Pallasii, *Desm.* Cephalotes Pallasii, *Geoff. Ann. Mus.* xv. Vesp. cephalotes, *Pall.* Spic. Zool. iii. t. 1 and 2. cop. *Schreb.* t. 61. Cephalote, *Buffon,* H. N. Suppl. iii. t. 2. Molucca bat, *Pennt.* Pteropus Cephalotes, *Tiedem.* Inhabits Molucca Islands.

See also Cephalotes tæniotis, *Rafin.* from Sicily.

48. Cephalotes, *Fr. Cuv.* Hypoderma, *Isid. Geoff.* Head short, broad, lips thick; wings arising from the centre of the back; index-finger not clawed.

Cephalotes Peronii, *Geoff.* Ann. Mus. xv. t. 9. cop. Dict. Sc. Nat. t. Hypoderma Peronii, *Isid. Geoff.* jun. Pteropus palliatus, *Geoff.* Ann. Mus. xv. 99. Inhabits Timor.

II.—*Account of a Botanical Excursion in the Alps of the Canton of Valais, Switzerland, in August* 1835*; and Catalogue of the Plants collected, with occasional Remarks.* By R. J. Shuttleworth, Esq. (Continued from p. 196.)

235. C. scabiosa, L. *α.* macrophylla, foliis radicalibus maximis lyrato-pinnatifidis, laciniis integerrimis, terminali ovato-obtuso maximo. *γ.* leptophylla, foliis radicalibus subbipinnatifidis, caulinis pinnatifidis, laciniis fere linearibus acutis subintegris, subtus, præsertim junioribus, subincano-tomentosis. C. scabiosa, *γ.* tenuifolia, Gaud ?

H. *α.* In dumetis inter Thermas Leucenses et Inden; *β* in collibus apicis inter Varen et Siders.

Obs. Folia radicalia in spec. meis var. *α*, 6 ad 8 uncialia laciniio terminali 2-3 uncias lata et 3-5 longa. Caulina etiam maxima sublyrata profundissime pinnatifida, laciniis etiam integerrimis arcuatis, recurvis. In var. *β.* capitula fere duplo minora quam in var. *α.*, involucro majis ovato, et phyllis pallidis breve ciliatis. Varietatem inter *α.* et *γ* fere mediam in segetibus Hiberniæ legi, foliis subbipinnatifidis, laciniis ovato-lanceolatis inciso-dentatis.

236. *Carlina* vulgaris, L.

H. In apricis inter Inden et Varen.

237. *Xeranthemum* inapertum, Willd.

H. In arvis incultis inter Varen et Siders, copiose.

238. *Hieracium* pilosella, L. H. foliis integerrimis obovato-elipticis, stolonibus repentibus, involucri squamis lineari-lanceolatis, scapo monocephalo. *α.* viride. Ser. foliis utrinque viridibus, sparse pilosis. H. P. *β.* viride, Gaud. Helv. v. p. 71, *β.* vulgare, foliis dorso-tomentosis, pilis utrinque sparsis longis hirtis. H. P. *α.* vulgare, Gaud. l. c. *γ.* arenarium mihi, late repens, pluriscapum, foliis minoribus facie viridibus pilis sparsis longis hirtis, dorso, stolonibusque, incano-tomentosis; capitulis parvis involucro incano. *δ.* incanum, involucro, foliisque utrinque incano-tomentosis, tomento brevissimo, vix pilosis. H. P. *β.* incanum, DC. H. Fr. iv. p. 23. H. P. *γ.* incanum, Gaud. l. c. *ε.* pilosellæforme, foliis dorso-incanis, facie sparse pilosis, scapo elato incano, pube brevi atra conspersa; capitulis majoribus, phyllis lineari-lanceolatis latioribus incanis, pube brevi atra ad carinam consitis. H. pilosellæ forme Hoppe, Gaud. l. c. H. pilosella alpina Hoppe exst. *β.* Peleterianum, foliis obovato-lanceolatis elongatis, sub-

tus tomentosis, scapo anthodioque longissime villosis. H. peleterianum Mérat. Rchb. H. P. γ. Dub. Bot. Gall. δ Gaud. l. c.
H. β. ad viam inter Inden et Varen ; γ. in arenosis ad Rhodanum prope Leuk ; δ. in pascuis M. Fünelen et in alpibus supra Tæsch ; ε. in collibus graminosis inter St Nicholas et Zermatt et in pascuis alpinis supra Zermatt.

Obs. Inter α. et ε. nullos limites invenire potui, variant nempe involucro incano vel viridi, phyllis linearibus, lineari-lanceolatis vel lanceolatis ; capitulis majoribus minoribusve ; foliis utrinque vel tantum facie sparse pilosis, dorso sæpius incano-tomentosis. Var. β. me judici potuis quam ε. a stirpe separanda : δ. sæpe extolonosum, sed etiam ut ε. stolonibus longis sæpe præditum ; folia majuscula, capitula sæpe majuscula. γ. varietas insignis ; stolones repentes nempe instar Polypodia Americana minora demum indurescunt, et scapi plures ex eodem nodo prodeunt.

239. *H.* dubium, Willd. H. auricula, Rchb. Germ. exc. No. 1719, α. vulgare, β. uniflorum, γ. pilosum, foliis facie longe pilosis.
H. α. et β. In pascuis alpinis M. Schwarzseeberg et Fünelen ; γ. Ad viam inter Stalden et St Nicholas.

240. *H.* angustifolium, Hoppe !
H. In pascuis et ad moles glaciales M. Schwarzseeberg, Fünelen, et supra Tæsch.

241. *H.* piloselloides, Vill. Rchb. H. florentinum, ii. piloselloides Gaud. β. acutifolium, minus alpinum, scapo brachiato 3-4 floro. Gaud. l. c. p. 8.
H. In arenosis inter Siders et Leuk, et ad viam inter Stalden et Visp., β. In pascuis M. Schwarzseeberg.

242. *H.* alpicolum, Schleich ! Gaud. l. c. p. 73.
H. rarissime ad moles glaciales, M. Fünelen.

Obs. Stirps rarissima. Caulis submonophyllus, 1-2 cephalus stellato-tomentosus, superne pilis longis sericeo-albidis, aliis brevibus glanduliferis nigris intermixtis, tectus : folia lineari-lanceolata dorso stellato-tomentosa, facie longe setosa : Involucrum subglobosum, pilis luridis hirsutissimum. Planta paradoxa huic Piloselloideis (H. angustifolio, Hoppe,) inde eriocephalis (H. glandulifero Hoppe) affinis.

243. *H.* glanduliferum, Hoppe ! H. glabratum, Schleich ! Thom ! exs. non Hoppe. H. Schraderi glabratum, Gaud ?
H. In M. Gemmi supra Schwarrenbach, in M. Fünelen.

Obs. Caulis pollicaris, semipedalisve, monocephalus, nudus vel folio unico minimo instructus, ubique sed præsertim superne indumento duplici tectus, tomento albo brevi et pilis glanduliferis nigris numerosissimis : Folia anguste-lanceolata, acuta glaucescentia glabriuscula vel facie pilis longis albidis, præsertim ad petiolum in-

structa, sæpius undulata. Involucrum densissime luride-villosum ut bene observat cl. Rchb. "Anthodium quasi murinam pellem sistat." Præcedenti magis quam H. alpino vel Schraderi affine.

244. *H.* Schraderi, DC.

H. In saxosis M. Gemmi ad talis glaciales Lammerngletscher, 31 Aug. 1836.

Obs. Involucro ad H. glanduliferum Hoppe, foliis magis ad sequentem et. H. villosum, L. occedit.

245. *H.* subnudum, Schleich!

H. In alpibus supra Tæsch.

Obs. Caulis submonocephalus, folia elliptico-lanceolata obtusa involucroque villosissima. Folia caulina pauca minima. Cum H. Schraderi conjunxit cl. Gaudin, sed H. villoso magis affine, quo transit varietate foliis acutis.

246. *H.* valde pilosum, Vill.

H. In saxosis M. Gemmi supra Schwarrenbach et ad lacum Dauben.

Obs. Caulis foliosus, folia caulina numerosa lata, amplexicaulia involucroque villosissima. In planta alpina caulis plerumque monocephalus, in planta ε Jurasso capitula 2-5.

247. *H.* villosum, L. α. folia integruiscula. β. caule humili foliis radicalibus longe petiolatis ad basin sinuato-dentatis vix longiori.

H. α. In M. Gemmi supra Schwarrenbach. β. in umbrosis supra Kandersteg.

Obs. Folia caulina pauciora angustiora quam in præcedenti, vix amplexicaulia: involucrum, caulis, et folia piloso-villosa.

248. *H.* rupestre, All.? Auct. ad Ped. Tab. i. f. 2, (sed non omnino cum nostra planta convenit.) α. caule scapiformi 1-2 flora nudiuscula, foliis dorso villosis. Gaud. Helv. v. p. 92. H. rupestre, Schleich. Thom. exs.!

H. In saxosis M. Gemmi supra Schwarrenbach.

Obs. Folia lanceolata, utrinque attenuata, firma, dentata, subtus pilosa, facie glabra.

249. *H.* staticifolium, Vill.

H. Ad viam et in apricis inter Inden et Varen, prope Leuk, inter Stalden et St Nicholas et (caule monocephalo) in glareosis M. Fünelen.

250. *H.* amplexicaule, L.

H. Prope Kandersteg.

251. *H.* Halleri, Vill. H. hybridum, Vill. Dauph. iii. Tab. 26.

H. In M. Gemmi supra Schwarrenbach.

252. H. intybaceum, Jacq. H. albidum, Vill.

H. *Zermatt. In M. Grimsula infra Hospitium.

253. *H.* prenanthoides, Vill. β. ramosum, caule elato, ramoso multifloro, foliis maximis firmioribus.

H. In pratis humidis prope Kandersteg ; β. inter Thermas Leucenses et Inden.

254. H. murorum, L. var alpina.

H. In glareosis et petrosis ad nives perennes M. Gemmi.

Obs. Caulis humilis pedalis, oligo (sæpius) monocephalus, sub nudus vel folio unico angustissimo instructus : folia radicalia brevè-petiolata lanceolata acuminata vel ovalia acuta, basi truncata, satis profunde inciso dentata dentibus patulis, mucroni glanduloso teretifiliformi terminatis. Capitula mediocra, involucro incano-pubescenti. Ad varietatem pictum et incisum auct. accedit, sed non omnino.

255. H. prunellæfolium, Vill.

H. In glareosis M. Gemmi ad nives perennes supra Schwarrenbach. Copiosissime in consort. Apargiæ Taraxaci et Ranunculi parnassæfolii.

256. H. sabaudum L. var. γ. β. villosum, Gaud. Helv. v. p. 109? Caule, foliisque ovato-lanceolatis amplexicaulibus sursum decrescentibus, summis minimis, hirsutis ; capitulis corymbosis et axillaribus solitariis, involucro pubescenti.

H. In apricis umbrosis inter Inden et Varen.

Obs. Hanc plantam etiam in Jurasso legi, et ab am. Thomas ut H. sylvaticum Gouan accepi.

257. H. lanatum, Vill.

H. In apricis inter Inden et Varen, et prope pagum Fünelen, supra Zermatt.

258. H. blattarioides, L. Soyeria—Monn. Catorica—Mœnch.

H. In umbrosis pascuisque humidis prope Kandersteg.

259. *Phœnicopus* decurrens, Cass. Prenanthes viminea, L.

H. Inter Stalden et St Nicholas.

Obs. Cum icone All. Ped. Pl. LII. f. 2, vel xxxiii. f. 1. (P. ramosissima) haud bene convenit nostra planta, et fateor has species non omnino intelligo. Ut P. ramosissima, plantam a cl. B. albis missam possideo, quæ, pusilla et ramosissima, diversa videtur. Nostræ plantæ, caulis bipedalis et ultra ramosus, ramis gracilibus elongatis ; capitula aggregata subsessilia secus ramos approximata, numerosa ; folia glabra concoloria, caulina inferiora pinnatifida, laciniis anguste lineari-lanceolatis bifidis vel integerrimis, summa linearia decurrentia ; Achenia striata scaberrima in stipitem longam aterrimam attenuata.

260. *Picris* hieracioides, L. β. alpestris, lævior, foliis lanceolatis, cordato-amplexicaulibus, sinuato-dentatis vel integriusculis ; ramis rigidis divaricatis, pedunculis valde incrassatis. γ. petiolata, scabra hirtaque sæpe multicaulis, caule pedali sesquipedali vix ultra, foliis radicalibus longissimis, caulinisque inferioribus

lineari-lanceolatis, lanceolatisve, obsolete sinuato-dentatis, in petiolum longum attenuatis, superioribus sessilibus, summis amplexicaulibus vix auriculatis ; corymbo terminali simpliciusculo, pedunculis brevibus vix incrassatis. P. hieracioides β. longifolia, Gaud ? P. umbellata, Nees ab Es. ?

H. β. in umbrosis humidis prope Kandersteg. γ. in pratis humidis inter Varen et Siders.

Obs. In var. β.—forma foliis sinuato-dentatis asperior est quam forma foliis integriusculis, cujus caulis glabriusculus. Planta Britannica asperrima a forma vulgari Helvetica recedit, pilis longioribus numerosissimis intricatisque. In var. γ—variat interdum corymbo subdichotomo, ramis elongatis erectis, foliisque caulinis superioribus sabauriculatis.

261. *Barckhausia* fætida, DC.

H. In incultis prope Varen, Siders, et in arvis inter Stalden et St Nicholas.

262. *Chondrilla* juncea, L.

H. In arvis incultis prope Siders et Leuk.

263. C. acanthophylla, Bork. in Rchb. Germ. exc. No. 1802. Chondrilla foliis, " radicalibus sinuato pinnatifidis, dentibus acuminatis pectinatis," (Rchb. l. c.) caulinis lineari-lanceolatis, lanceolatis, ovato-lanceolatisve, setaceo-dentatis, involucro farinoso canescenti. α. angustifolia mihi, foliis lineari-lanceolatis setaceo-dentatis vel interdum subintegris, dentibus paucis ad basim instructis. Ch. acanthophylla Rchb. exsic ! β. latifolia mihi, foliis lanceolatis vel ovato-lanceolatis setaceo-dentatis. C. rigeus, Rchb. Germ exc. No. 1803 ? C. graminea, M. Bieb. Tour. Cauc. ii. 244 ? (Plantam ε Volga sub hoc nomine a cl. Bieberstein missam possideo, quæ nullo modo a nostra differt, folia nempe etiam summa ovato-lanceolata marginibus setaceo-dentatis, dentibus tantam minus conspicuis quam in planta nostra : sed cum diagn. cl. auctoris male convenit.)

H. Ad viam et in arvis inter Stalden et St Nicholas.

Obs. Glaucescens, caulis ad basim hispidus, in α (ut in Spec. Rchb.) satis ramosus, ramis minus longis quam in C. juncea, suberectis ; in var β. minus ramosus, ramisque brevioribus. Capitula majora, involucris farinosis : achenia ut in C. juncea, nisi forsan longiora, superne ad angulos exasperata, et apice dentibus 5 longioribus coronata. Helvetia nova cives, a C. juncea, distinctissima, sed forsan cum C. latifolia, MB. l. c., mihi ignota, conjungenda, quæ differt squamis involucri " setis longiusculis patentibus hispidis."—Differentiæ ε colore ligularum a cl. Rchb. sumptæ, me judici, nulli momenti sunt.

264. *Lactuca* sacriola, L. α. foliis radicalibus ad carinam aculeo-

latis, panicula laxa, ramis adscendenti-patentibus. β. foliis omnibus ad carinam muticis, &c. γ. foliis omnibus ad carinam muticis panicula exacte-pyramidata, ramis deflexo-patentibus.

H. α. Ad viam inter Siders et Leuk. β. in arvis inter Stalden et St Nicholas. γ. in incultis prope Varen.

265. L. perennis, L.

H. In apricis inter Stalden et St Nicholas.

266. *Podospermum* laciniatum, L.

H. In incultis prope Siders.

267. *Leontodon* alpinus, Jacq. Apargia Host.

H. In pascuis M. Fünelen.

268. L. crispus, Vill.

H. Ad pagum Fünelen supra Zermatt.

Obs. In exempl. macrioribus scapus interdum divisis, dicephalus.

269. *Apargia* taraxaci, Willd. β demidata, involucro pilis brevibus minus copiose hirsuto, foliisque minus dentatis.

H. In glareosis M. Gemmi supra Schwarrenbach copiose. β. rarius.

Obs. Planta Scotica, cujus spec. nimis manca possideo, videtur diversa. Involucrum var. β. vix magis hirsutum quam in Leontodon Alpino, sed scapus valde incrassatus omnino A. taraxaci α.

270. A. hyoseridifolia, Less. Syn. p. 132. Hieracium, Vill.

H. rarissime in glareosis ad lacum Dauben M. Gemmi in consort. A. taraxaci et ranunculi parnassifolii. 31 Aug. 1836.

Obs. Pulcherrimæ rarissimæque stirpis nova localitas.

271. *Taraxacum* lævigatum, DC. Rchb. Germ. exc. No. 1796.

H. Ad nives perennes M. Schalmetti in M. Gemmi.

272. *Tragopogon* campestris, Bess.? En. Pl. Volh. p. 84. Tr. involucro sub 8-phyllo, phyllis decoloratis flosculos æquantibus vel superantibus, pedunculo subincrassato; foliis linearibus, linearilanceolatisve carinatis planis strictis, Achenius incurvatis muricato-striatis.

H. In pratis inter Thermas Leucenses et Inden.

Obs. Caulis bi-tripedalis ramosus, ramis erectis strictis; capitula parva semi aperta (non ut in T. pratensi horizontaliter patentia,) involucrum flosculos interdum multo excedens, sed sæpius æquans vel paulo superans, phyllis 5–8. Flosculi flavi, antheris fuscis atropurpureisve. Hanc plantam etiam copiose in segetibus vallis Lignieres in Jurasso inveni: seruis floret quam T. pratensis, (in Jurasso 10, &c. Jul. in Valesiæ, 19. Aug.) Meram varietatem Tr. pratensis vix constituerit potest, nisi etiam et Tr. major inter var. Tr. pratensis redigendus. Medius inter Tr. pratensem et majorem, ab utroque satis differt: variat ut affines foliis apice tortilibus.

273. *Sonchus* alpinus, auct.

H. In M. Grimsula infra Hospitium.

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274. *Scabiosa* columbaria, L.

H. In graminosis aridis prope Varen.

Obs. Forma calcarea. Caulis pedalis, sesquipedalis ramosus foliisque canescenti-pubescens. Folia caulina tenuissime bipinnatifida vel pinnatifida laciniis linearibus incisis involucrum floribus brevius vel vix æquale capitula parva.

275. *S.* lucida, Vill.

H. In pascuis M. Gemmi supra Schwarrenbach.

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276. *Galium* lucidum, All. Ped. ii. p. 77. β. caule inferne foliisque inferioribus pubescentibus, Gaud. Helv. i. p. 419.

H. In apricis inter Inden et Varen.

Obs. Vix a G. tenuifolio, All.! distinguenda. In exempl. meis G. tenuifolii ex Herb. All. folia non sunt retrorsum (ut habet Cl. Rchb.) sed autrorsum scabra.

277. *G.* helveticum, Weig. Gaud.

H. In glareosis M. Gemmi supra Schwarrenbach.

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278. *Astrantia* minor, L.

H. In umbrosis M. Gemmi supra Kandersteg.

279. *Bupleurum* ranunculoides, L. var. involucellis octophyllis.

H. In saxosis et graminosis, M. Schwarzseeberg.

Obs. Caulis simplex uncialis—pedalisve. Folia summa amplexicaulia cordata ovato-lanceolata, potius bracteæ vel involucra dicenda, nam textura et forma omnino cum involucris conveniunt ; et sæpe in eorum axillis flores abortivos vidi. In exempl. fere omnibus, qua ex alpibus accepi et in Jurasso legi, involucella constanter 5-phyllæ sunt ; involucra autem monophylla usque ad hexaphylla inveni—B. caricifolium W. species mihi dubia, et forsan recte a cl. Koch hæc specie conjuncta.

289. *Athamantha* cretensis, L. α. alpina, dense incano-hirsuta, foliis bipinnatis, pinnis pinnatifidis, laciniis brevibus lineari-ovatis acutis.

H. Ad rupes M. Gemmi supra Schwarrenbach.

Obs. In Jurasso occurrunt var. β and γ.

β. tomentosa, foliis tripinnatis, pinnis pinnatifidis, laciniis linearifiliformibus elongatis acutis apiculatisve. γ. glabriuscula lætevirens, laciniis pinnarum filiformibus elongatis.

281. *Gaya* simplex. Gaud. Ligusticum, All. Pachypleurum—Rchb.

H. In pascuis, M. Gemmi supra Schwarrenbach, supra Zermatt et Tæsch.

282. *Imperatoria* Ostruthium, L.

H. In petrosis M. Fünelen.

283. *Laserpitium* hirsutum, Lam., L. Halleri Gaud., Hall. Tab. 19. Opt.

H. In petrosis alpinis supra Tæsch.

284. *Torilis* helvetica, Gm. Bad. i. 617. β. anthriscoides, DC. Prod. iii. 219.

H. In arvis incultis prope Varen.

Obs. Caulis ramosus bipedalis, ramis suberectis. Pedunculi non longiores quam in T. Helvetica α. (ex agris prope Genevam,) fructusque vix major, minus coloratus: differt tantum statura albiori, caulibus ramisque erectioribus. T. neglecta, Schult. DC. Prod. l. c. Koch. Syn. p. 313. T. infesta, Rchb. Germ. exc. No. 2910, videtur notis nimis lævibus a T. helvetica separata ; et me judici auctæ nomine T. infestæ, Hoffm. designandæ.

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285. *Saxifraga* cæsia, L.

H. Ad fissuras rupium M. Gemmi supra Kandersteg et Schwarrenbach copiose.

Obs. Variat caudiculis elongatis, foliisque multo minus congestis.

286. *S.* oppositifolia, L.

H. In rupibus M. Gemmi supra Schwarrenbach et ad moles glaciales summi jugi alpium supra Tæsch.

287.* *S.* Hornungii, mihi.

Saxifraga caulibus prostratis ramosis laxe cæspitosis, ramis adscendentibus, foliis oppositis remotiusculis obovatis spathulatisve apice subincrassatis unipunctatis dorso planis sabcarinatis, superioribus sæpe alternis, laciniisque calycis glanduloso ciliatis, floribus terminalibus 2-3 capitatis, petalis distantibus lanceolatis stamina subæquantibus. S. biflora, Gaud. Helv. iii. p. 95. Koch. Deuts. Fl. iii. p. 126. Syn. p. 269. Dub. Bot. Gall. i. p. 207. Dec. Prodr. iv. p. 18. Rchb. Germ. exc. No. 3604, et exscc ! Hornung in Bot. Zeit. 1835, p. 470.—*Non All.*

H. In alpibus supra Zermatt, etiam In M. Sylvio Vall. D. Nicolai, et in M. Tzermenonanz (Gathnick !) Alp. Tyrol. prope Zell. (Sauter in Rchb. exscc !)

Obs. Cl. Gaudin, l. c. iconem Allionii molam esse observat ; sed certe auctores omnes citati nec descriptionem Allionii intento animo legerunt, neque ejusdem iconem recte examinaverunt. Allionius in Ped. ii. p. 71, No. 1530, de sua planta ita disseruit. " Flos magnus pulchre roseus petalis ovato-acutis duplo et ultra calyce amplioribus ;" " Stamina decem embryone vix altiora purpurea," et ita etiam in icone sua Pl. XXI. f. 1. optime depinxit. Hæc descriptio cum S. biflora, auct. (nostra S. Hornungii) nullomodo

convenit, et, ut etiam icon. ad sequentem plane pertinent. Quod "foliis alternis in ramis floriferis, All. l. c. et ic." attinet, occurrunt in utraque specie, sed ad formam non ad typum pertinent. Hoc pacto manifeste patet (cf. seq.) vera planta, All. auctoribus hucusque ignota, a cl. Kochio et Hornungio l. c. primum distincta ut nova species descripta est.

288. *S.* biflora, All. Ped. ii. p. 71, No. 1530. Tab. xxi. f. 1, (rami floriferi uniflori; sed opt.) nec auct.

Saxifraga caulibus prostratis ramosis laxe cæspitosis, ramis adscendentibus, foliis oppositis laxe imbricatis obovatis spathulatisve apice subincrassatis unipunctatis dorso planis subcarinatis, superioribus interdum alterius laciniisque calycis glanduloso ciliatis, floribus terminalibus solitariis vel 2-3 capitatis breve pedunculatis, petalis oblongis contiguis stamina bis-terve superantibus. S. Kochii Hornung, l. c. p. 465, et seq. Koch. Syn. l. c. (Desc. opt.)

H. In glareosis ad moles glaciales Lammerngletscher M. Gemmi. 31 Aug. 1836, cæspites laxos maximosque efficiens.

Obs. Folia infima interdum rosulata, multo congestiora quam in præcedente: rami floriferi sæpe uniflori (et hujus formæ icon, All. citata optima) vel 2-3 flori in eodem individuo. Color in utraque specie diversa in S. Hornungii (e sicco) corolla atropurpurea, folia rubro-purpurascentia: in S. biflora (Planta viva et sicca) corollæ lilacinæ, purpurascentes, et folia omnino viridia Species distinctæ, sed in Herb. meo sub nomine S. bifloræ intermixtæ adsunt.

289. *S.* aspera, L. Koch. l. c. p. 270. S. aspera *α.* elongata, Gaud.

H. In petrosis alpium supra Tæsch.

290. *S.* bryoides, L. Koch. l. c. S. aspera *β* bryoides, DC. Gaud.

H. In graminosis ad nives perennes M. Gemmi—in M. Fünelen.

291. *S.* stellaris L.

H. In M. Gemmi supra Kandersteg, et in uliginosis supra Schwarrenbach.

292. *S.* muscoides, Wulf. Koch. l. c. *α.* compacta Koch. l. c. p. 272. S. muscoides *α.* microphylla, Gaud. Helv. iv. p. 130. *γ.* laxa. Koch. l. c.

H. *α.* in M. Gemmi in rupibus prope "der Wintereck." *β.* supra Schwarrenbach.

293. *S.* exarata, Vill. Dauph. iii. p. 674. Pl. 45. *β.* laxa, Koch. l. c. p. 273. S. intermedia, Gaud. et Koch. l. c. Thom. exs.!

H. ad moles glaciales summi juge Alpium supra Tæsch.

294. S. androsacea, L.

H. In M. Gemmi, supra Schwarrenbach.

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295. *Sedum* atratum, L.

H. vulgatissimum in M. Gemmi.

296. S. annuum, L. Koch. Rchb. S. æstivum, All. Ped. No. 1746. S. saxatile, Gaud. Helv. iii. p. 222. nec. All.

H. ad muros inter St Nicholas et Zermatt.

297. S. repens, Schleich. Gaud. S. saxatile, All. Tab. lxv. f. 6.

H. In glareosis ad moles glaciales, M. Fünelen.

298. *Sempervivum* arachnoideum, L.

H. ad rupes inter Stalden et St Nicholas ; in pascuis sterilibus inter Tæsch et Zermatt, et in M. Fünelen.

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299. *Scleranthus* annuus, L.

H. ad viam inter St Nicholas et Zermatt.

300. S. perennis, L. β. erinaceus, mihi, humilis confertosissimus, caulibus prostratis ramosissimis, floribus numerosissimis in sphæram densissimam congestissimis.

H. copiose in saxosis M. Grimsulæ, supra Obergestelen.

Obs. Florum sphæra ita congesta, ut nihil aliud conspiciendum. Folia, nisi perpauca ad dichotomias superiores, vix ulla. Calycis segmenta obtusa, late membranacea, fructifera clausa. Habitu a typo et congeneribus valde differt, proxime tamen Sclerantho neglecto Rochel affinis. S. neglectus, Roch. mihi bona videtur species, sed in exempl. meis a cl. Rochel et Heuffel in cac. M. Muraru Bannatu lectis, calycis fructiferi partitiones potius clausæ quam patentes, cf. Koch. Deuts. Fl. iii. p. 175, 176, et Syn.

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301. *Herniaria* glabra, L.

H. in pascuis aridis arenosis ad Vispam inter Tæsch et Zermatt.

302. H. alpina, Vill.

H. rarius ad moles glaciales supra Tæsch.

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303. *Epilobium* Dodonæi, Vill. Gaud. erectum, floribus racemosis numerosissimis, foliis obsolete denticulatis. E. Dodonæi, Koch. Syn. p. 239. E. rosmarini folium, Hænke, Rchb. pl. crit. ic. 522. β. prostratum, Gaud. Helv. iii. p. 9. humile, pauciflorum, foliis evidentius denticulatis. E. augustissimum, Rchb. pl. crit. ic. 523. E. denticulatum, Wend. Koch. Deuts. Fl. iii. p. 12. E. Fleischeri. Hochst. Koch. Syn. p. 239.

H. α. in petrosis inter Inden et Varen. β. in M. Gemmi, supra Kandersteg.

Obs. α et β. variant foliis plus minusve conspicue denticulatis, stylo ad basin vel supra medium sericeo-barbato (interdum et etiam in var. β. omnino glabro), staminibus sublongiori, æquali vel breviori, demum semper deflexo (quod in icon. Rchb. non depictum est.)

Unicum discrimen inter α. et β. videtur caulis prostratus, et petala obtusiora, var. β.

304. E. organifolium, Lam. Rchb. l. c. ic. 314.

H. Ad rivulos M. Gemmi, supra Schwarrenbach.

Obs. Capsulæ longiores, longiusque pedunculatæ sunt quam in icon. cit.

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305. *Cotoneaster* vulgaris, Lindl. β. prostrata.

H. Ad rupes in Alpinis supra Zermatt.

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306. *Rosa* Alpina, L. α. fructu elliptico-pyriformi vel fusiformi. αα. fructu, calycis segmentis pedunculisque glabris, petiolis serraturis nervisque foliolorum glanduloso-pilosis. β. fructu subgloboso. βα. fructu pedunculisque glabris, calycis segmentis, petiolis, serraturis nervisque foliolorum glanduloso-pilosis. ββ. fructu glabro, pedunculis glanduloso-hispidis, calycis segmentis, petiolis, serraturis nervisque foliolorum, glanduloso-pilosis.

H. α. In alpinis supra Zermatt. β. Ad sepes inter St Nicholas et Zermatt.

Obs. Var. αα. calycis segmenta eximie foliacea.

307. *R.* glandulosa, Bellardi, Koch. Deutsl. Fl. iii. p. 462, Syn. p. 225. Dub. Bot. Gall. i. 177. Rosa glandulosa glauca junior rubicunda, aculeis geminis vix falcatis aut nullis; foliolis 5–9, ovato-rotundis duplicato serratis stipulisque latiusculis acutis margine glandulosis; tubo calycis subgloboso pedunculisque glanduloso-hispidis, sepalis subintegris longe subspathulatis corollam superantibus. α. inermis mihi, foliolis 7–9 ellipticis, floribus solitariis, sepalis integris, et fructu globoso. β. aculeata mihi, foliolis majusculis 5–7 subrotundis quadruplo-serratis, floribus subternis, sepalis 3 pinnatifidis, et fructu ovato. R. rubrifolia glandulosa et R. rubrifolia montana, Ser. in Mus. Helv. p. 12. Tab. ii. f. 3 and 4. (folia pessima.) R. rubrifolia montana, Gaud. Helv. iii. p. 348. excl. Syn. plur. R. Reyneri, Hall. fil. ! Ser. ! Schleich !

H. (α. In Jurasso, in collibus vallis Liguières ad pedem M. Chasseral.) β. Ad sepes inter St Nicholas et Zermatt.

Obs. R. rubrifolia, β. pinnatifida, Ser. Gaud. l. c. ad R. rubrifoliam Vill. pertinet. R. montana, Vill. absque dubio diversissima, omnino abhorret. Rchb. in Germ. exc. No. 3780, hanc speciem hybridam "rubrifoliam-villosam" esse existimat, mihi autem species omnium pulcherrima ab affinibus facillime distinguenda videtur Species rarissima, paucis cognita, hucusque, variationibus supra no-

tatis exceptis, constans, sed cultura nondum subjecta. Ut observat cl. Koch, R. rubrifoliæ et alpinæ affinis, sed affinitas cum R. canina mihi perobscura.

308. *R.* canina, L. α. foliolis simplice vel duplicato-serratis glabris, fructu globoso glabro. β. foliolis duplicato-serratis glabris, petiolis, sepalis fructuque ovato-globoso glanduloso-setosis.

H. Ad sepes inter St Nicholas et Zermatt.

309. *R.* rubiginosa, L. Var. fructu ovato-elliptico pedunculisque glabris. R. rubiginosa, δ. sepium, Gaud. R. canina, δ. sepium, Koch. Syn. p. 227.

H. In collibus inter Varen et Siders.

Obs. Certe ad R. rubiginosam non ad caninam redigenda. Tomentum ferrugineo-glandulosum, odorque aromaticus.

310. *R.* villosa, L. R. pomifera, Herm. Koch.

H. Ad sepes inter St Nicholas et Zermatt, et inter Brieg et Münster.

Obs. Variat floribus solitariis, ternis vel sub corymbosis. Var. γ. corymbosa, Gaud. differt solummodo fructu basi tantum hispidulo. Folia forsan maxima generis, fructus globosus, nutans, maximus, interdum in collo brevi, coarctatus.

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311. *Geum* (*Sieversia*) reptans, L.

H. In saxosis M. Gemmi supra lacum Dauben, rarius.

312. *G.* (*S.*) montanum, L.

H. In saxosis M. Gemmi supra Schwarrenbach, et ad lacum Dauben, copiose. In M. Fünelen.

313. *Potentilla* multifida, L.

H. Ad moles glaciales summi jugi alpium super Tæsch.

314. *P.* argentea, L. Var. ? β. foliis planis latioribus obtuse inciso-dentatis.

H. In pascuis aridis inter St Nicholas et Zermatt, β. unicum individuum inveni.

Obs. Forma monstrosa vel forsan P. collina, Wig. Koch. Syn. p. 214, sed exemplo meo flores carent.

315. *P.* aurea, L. P. Halleri, Ser.

H. In M. Fünelen.

316. *P.* Salisburgensis, Hænke. P. aurea, Ser. α. firma, Koch. Syn. p. 216. P. aurea, β. firma, Gaud. P. sabauda, Thom. exs.! vix DC. α. β. Macrantha, villosior, foliolis discretis, corolla fere duplo majori.

H. In M. Gemmi in graminosis ad nives perennes supra Schwarrenbach.

Obs. Foliola late ovata, obtusissime incisa sese invicem margine tegentia, serraturis rotundatis ; stipulis magnis, corolla magna, petalis obcordatis, calycis segmenta valde inæqualia alternatim duplo latiora et longiora, omnia fere obtusa, plus minusve colorata. Planta pygmæa plus minusve hirsuta, vix ultra 2 uncias alta, parum cæspitosa. Bene quadrat cum exempl. *a b.* Gaudino acceptis, sed minus villosa et colorata. P. sabauda, DC. (spec. ε Gallia possideo,) vix huc sed potius ad varietatem elatiorem pertinet. P. alpestris, Hook. Brit. Fl. ad varietatem β. graciliorem, Koch, l. c. pertinere videtur.

317. *P.* verna, L. Var. æstiva, Hall. fil. in Mus. Helv. p. 32. Gaud. ?

H. Inter St Nicholas et Zermatt.

Obs. Maculam croceam ad basim petalorum non vidi : differt a typo, hirsutie, foliisque radicalibus majoribus longe petiolatis et profunde incisis.

318. *P.* grandiflora, L.

H. In pascuis et petrosis M. Fünelen.

319. *P.* minima, Hall. fil. in Mus. Helv. p. 51.

H. Copiose in M. Gemmi prope Schwarrenbach, et ad lacum Dauben, &c.

320. *P.* caulescens, L.

H. In rupibus inter Inden et Varen.

321.* *Sibbaldia* procumbens, L.

H. Zermatt.

322. *Alchemilla* vulgaris, L. β. subsericea, Gaud. Koch. A. hybrida, L. et Auct.

H. In M. Gemmi supra Schwarrenbach.

323. *A.* pubescens, M. Bieb. Taur. Cavl. i. p. 114, excl. syn. pl. Koch, Syn. p. 231. A. pubescens, Lap. !

H. Ad moles glaciales valleculæ Tæsch.

Obs. Planta a cl. M. Bieb ! missa tantum elatior et, nisi foliis minus profunde incisis, potius habitum sequentis refert. Differt a precedenti foliis tantum apice serratis, subtruncatis, nec circumserratis ; a sequenti foliis crenato-dentatis, pubescentibus, et panicula multo congestiori : sed opinor cum sequente ut var. β. pubescens conjungenda.

324. *A.* fissa Schummel. Koch, Syn. p. 231. Gaud—Rchb. exsic. !

H. cum præcedenti.

Obs. Species distincta nullomodo cum A. vulgari conjungenda.

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325. *Ononis* Columnæ, All.

H. In arvis et incultis prope Varen et Siders.

326. *O.* Natrix, L.

H. In apricis inter Inden et Varen et prope Siders.

Obs. O. rotundifoliam, L. Etiam inter Inden et Varen observavi sed non legi.

327. *Anthyllis* vulneraria, *L.* α. floribus flavis, foliis caulibusque parce villosis aut subglabris, DC. Prod. ii. p. 170. β. purpurascens mihi.

H. α. In M. Gemmi infra Schwarrenbach. β. ad moles glaciales M. Fünelen.

Obs. α.—Forma alpina, prostrata, calyce dense sericeo excepto, glabriuscula ; capitula maxima, corollis saturate flavis—β. est varietas insignis forma, glacialis, prostrata, appresse sericea ; caulis, petioli, bractei, calyces apicibus et interdum foliorum margines, luride purpurascentes. Corollæ ochroleucæ, vexillo dorso purpurascente, carina apice purpurea ; foliola lateralia minima, interdum plane nulla.

328. *Medicago* falcata, L. β. versicolor, Koch, Syn. p. 160 ?

H. Ad viam in arenosis prope Varen.

Obs. Procumbens adscendensve, folia quoad firmam magnitudinemque variabilia ; bracteæ interdum minimæ ; corollæ violaceæ, flavescentes ; Legumina falcata vel cochleata sub 2-cycla, plus minus ve pubescentia.

329. *Trifolium* ochroleucum, L.

H. In pascuis valleculæ Tæsch.

330. *T.* saxatile, All.

H. Ad moles glaciales summi jugi alpium supra Tæsch.

331. *T.* fragiferum, L.

H. Ad viam inter Stalden et St Nicholas.

332. *T.* cæspitosum, Reyn.

H. In pascuis ad moles glaciales supra Tæsch.

333. *T.* badium, Schreb.

H. Ad moles glaciales supra Tæsch.

334. *Lotus* corniculatus, L. ε. tenuifolius, DC. ζ. uniflorus, Gaud.

H. ε. in arenosis prope Leuk. *ζ. Zermatt.

Obs. In var. ε. Pedunculi bini in capitulo 4-6-floro congesti. ζ. piliosusculus, glaucescens, folia subrhomboidea.

335. *Tetragonolobus* siliquosus, Roth.

H. In paludosis prope Pfyn inter Siders et Leuk.

336. *Colutea* arborescens, L.

H. In apricis inter Inden et Varen.

337. *Phaca* lapponica, Wahl. Helv. p. 131, in Ann. DC. Prod.

Oxytropis.—Gaud. Koch. Syn. Rchb. Germ. exc. No. 3273[b], in corr. Astragalus acutifolius Schleich.!

H. rarissime in M. Schwarzseeberg, et ad moles glaciales summi jugi alpium supra Tæsch. in cons. Oxytrop. cyanæa, M. Bieb.

Obs. Caulescens, interdum subacaulis, sericeo-pilosa. Legumina brevissime pubescentia, nigrescentia, ovalia, pendula. Forma subacaulis, florens, ægre ab Ox. cyaneæ distinguenda.

338. *Oxytropis* Uralensis, DC. β. villoso-sericea, scapis, petiolis, calycibusque dense villoso-sericeis, foliolis latioribus densissime sericeis, junioribus villosis, leguminibus subremotis ovato-oblongis.

H. In collibus et pascuis aridis prope Siders.

Obs. Var. γ. appresse-sericea mihi, quam ad rupes M. Bürglen ditione Bernensi (circa 5000's-m.) legi, differt foliolis appresse sericeis, sæpe angustioribus, et leguminibus ovatis brevioribus confertis. Planta Scotica variat leguminibus ovatis vel ovato-oblongis, sed sæpius minus sericea quam var. γ.: differt ab. O. sordida, Pers. (quacum conjuncta est in Syn. pl. suâ,) specie mihi valde dubia, capitulis erectis nec cernuis. Bracteæ in utraque var. variant calyce breviores vel sublongiores. O. sordida, Gaud.! Helv. vi. p. 360, in vallecula glaciali, Roththal, ab. am. Roth lecta et mecum communicata, est forma pusilla O. campestris: capituli certe cernua, sed secundum asseverationem repertoris amici ipsius, ex exemplaribus marcidis et male exsiccatis orti sunt.

339. *O.* campestris, DC. Variat α. scapis decumbentibus, folia æquantibus, foliolis oblongis. β. scapis adscendentibus, folia superantibus, foliolis oblongis. γ. scapis elatioribus suberectis, folia superantibus, foliolis lanceolatis acuminatis.

H. α. In pascuis M. Gemmi prope "die Wintereck," et supra Schwarrenbach. β. prope Zermatt. et in M. Schwarzseeberg et Fünelen. γ. prope pagum Zermatt.

Obs. sæpe fere pedalis evadit.

340.* *O.* fœtida, DC.

H. In alpibus supra Zermatt.

Obs. Scapi superne lana sæpe nigra tecti, foliola glanduloso-viscosa. Legumina pubescentia majuscula, subarcuata.

341. *O.* pilosa, DC.

H. In apricis prope Siders.

342. *O.* montana, DC.

H. In M. Gemmi supra Schwarrenbach.

Obs. Minute pubescens, legumina longe stipitata brevissime pubescentia, duplo latiora quam in sequenti.

343. *O.* cyanæa, M. Bieb. Taur. Cauc. iii. p. 503.

H. In M. Schwarzseeberg et ad moles glaciales supra Tæsch.

Obs. Molle sericea, legumina brevissime stipitata, dense sericeo-villosa, suberecta, ovato-cylindrica. c. M. Bieb. l. c. est var. sua β. albana. Non intelligo quomodo O. triflora Hoppe Koch, Syn. p. 182, a nostra cyanæa differt: In O. cyanæa racemi sæpe triflori sunt.

344. *Astragalus* alpinus, L. Phaca, DC.

H. In M. Gemmi supra Schwarrenbach, in M. Schwarzseeberg.

345. *A.* leontinus, Wulf.

H. In pascuis alpinis et in petrosis supra et prope Zermatt.

346. *A.* onotrychis, L.

H. In pascuis arenosis prope Siders et ad viam prope Leuk.

347*. *A.* aristatus, L'Herit.

H. Zermatt.

348*. *A.* leiocarpus mihi.

Astragalus acaulis, foliolis ovatis obtusis numerosis (circa 35,) glaucescentibus brevissime mucronatis, petiolisque parce pilosis; corollis calycibusque glabris, dentibus calycis longe subulatis; leguminibus trigono-compressis dorso applanatis ovatis mucronatis, etiam junioribus glaberrimis, brevissime stipitatis.

Obs. Imprimis pro A. fabaceum, M. Bieb. et DC. Prod. habui, sed differt a desc. DC. scapis brevissimis foliis multo brevioribus, et dentibus calycinis longe subulatis: et Cl. M. Bieb. in Ann. in Fl. Taur. Cauc. iii. p. 496, observat legumen plantæ suæ ab A. Bœtici legumine haud absimile, quocum nostra planta nullam affinitatem habet.

Legumina minora et magis compressa quam in A. exscapo, perfecte bilocularia, erecta vel pendula. In spec. meis male exsiccatis corollam examinare non potui. Maxima cum A. exscapo L. affinitas, sed ab eo, præsertim leguminibus minoribus intra calycem breve stipitatis, glaberrimis, et ad suturam magis incrassatis, et ab omnibus Astragalis Tauricis vel Rosicis mihi cognitis omnino distinctus.

A. utrigerum et longiflorum, Pall. possideo sed tantum florentes.

Hujus plantæ exemplaria nonnulla cum multis A. exscapi, L. mixta, et cum multis aliis, vallis D. Nicolai indigenis a pastori Valesiaco emi: sed certe procul dubio est, Alpium vallis Zermatt, ubi A. exscapus copiose viget, hæc pulchra planta incola et indigena.

349.* *A.* exscapus, L.

Astragalus acaulis, ubique, calycis tubo corollesque exceptis, dense molliterque hirsutus; foliolis ovatis vel subrotundis, interdum retusis, plerumque muticis; scapo nullo; calycis dentibus subula-

tis, leguminibus sessilibus subtrigono-compressis acuminato-mucronatis, junioribusque dense-hirsutis erectis.

H. Zermatt.

350. *Coronilla* vaginata, Lam. Koch., Syn. p. 187.

H. In arvis incultis et in apricis prope Varen.

Obs. Frutescens, prostrata, foliolis ovatis obtusis interdum subretusis apiculatis, infimis, nisi foliorum superiorum, a caule remotis.

351. *C.* coronata, DC. Koch., Syn. p. 188.

H. In apricis ad viam inter Inden et Varen.

Obs. Fruticosa, diffusa ramosissima, ramis adscendentibus, foliolis glaucis retusis mucronatis, infimis caule approximatis. Planta rarissima.

352. *Onobrychis* arenaria, DC. Hedysarum arenarium Viet ! Hedysarum carneum, Schleich ! H. angustifolium, Thom. !

H. In pascuis aridis prope Varen et Siders.

Obs. Rarissime occurrit, et mihi nondum satis cognita.

353. *Lathyrus* heterophyllus, L.

H. In vineis et ad sepes prope Varen.

Obs. L. latifolii var. foliolis bijugis, Rchb. Germ. exc. No. 3458, "Tyro"—et species distincta in corrigendis, No. 3458^{b}.—Rchb. peritus. !

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354. *Rhamnus* pumila, L.

H. In rupibus, M. Gemmi supra Schwarrenbach.

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355. *Geranium* lividum, L'Herit. G. phæum β. Koch.

H. In saxosis, M. Gemmi supra Kandersteg, 29 Aug. 1836, ad sepes infra Thermas Leucenses.

Obs. Species distincta non tantum corollæ colore, sed etiam foliis 5-7 fidis tenuiterque inciso-dentatis.

356. *G.* sylvaticum, L.

H. In M. Gemmi supra Schwarrenbach, et Thermas Leucenses : In M. Fünelen et in alpinis supra Tæsch.

357. *G.* aconitifolium, L. Herit.

H. In alpibus supra Tæsch.

Obs. Semina, ut et præcedentis, subtilissime punctulata.

358.* *Hypericum* perforatum, L.

H. Zermatt.

359. *H.* dubium, Leers. Gaud. H. quadrangulare, L. ex Fries, Rchb. et Koch, non Sm. vel auct.

H. copiose in M. Gemmi supra Kandersteg.

360. *Linum* tenuifolium, L.
H. In pascuis aridis prope Siders.

361. *Gypsophila* Saxifraga, L. et auct. G. rigida Rchb. ! germ. exc. et exsic. Tunica Saxifraga, Scop. Koch, Syn. p. 94.
H. In apricis et arenosis inter Inden et Varen.
Obs. Cl. Smith et Rchb. nostram plantum a Linnæana diversam esse habent; sed vix recte: nam in Lin. Spec. Plant. ed. 3^{tia} Gypsophilæ et saxifraga et rigida perennes notantur. Descriptio Bauhini "Betonica coronaria sive Tunica minima," Hist. iii. p. 337, certe ad plantam nostram pertinet. et ε loco Bauhiniano, "Genevæ in muris, &c. et au Plain palais," specimina multa legi, qua omnino ζ. saxifraga nostra sunt. Icon Bauch. l. c. certe malam.
In Caryophyllarum speciebus bracteatis fere omnibus, numerus et situs Bractearum valde inconstantes. G. scabra Schult ! huc a Rchb. recte allata, est planta tenuior scabriuscula, bracteis inæqualibus 2-3-4, videtur culta.
362. *G.* repens L. α prostrata alpina, floribus roseis; ascendens, campestris erectiuscula, floribus pallide carneis.
H. α. In saxosis M. Gemmi supra Schwarrenbach. β. In arenosis ad viam inter Visp et Brieg.
363. *Dianthus* atrorubens, All. D. vaginatus alpinus, Rchb. exs. !
H. In M. Gemmi supra Thermas Leucenses; prope Inden, in collibus inter St Nicholas et Zermatt, et in alpinis supra Tæsch.
Obs. I^{ma}. Species intricatissima et forsan mere varietas D. carthusianorum, L. quo videtur colore atro rubente petalorum, et petalis minoribus solummodo differe. In alp. capitulum semper pauciflorum, sæpius 1—6 florum, et caules vix semipedales. cf. Koch, Syn.
Obs. II^{da}. D. atrorubens, Rchb. Pl. Crit. vi. ic. 735, certe non est pl. Allionii sed Biebersteinii (D. capitatus, DC.)
D. diutinus, Rchb. l. c. ic. 729, quoad incisionem petalorum et dentes calycinas cum D. polymorpho MB. a cl. Fischer Goriusk: et Schott misso omnino convenit: calyx in exempl. meis occurrit dentibus obtusiusculis et subacutis, sed nunquam "rotundato-obtusos" observavi.
D. vaginatus, Rchb. Pl. Crit. l. c. ic. 731, et exsic ! nullomodo a D. carthusianorum campestri differt: nervi validi bractearum in icon. cit. depicti, in exempl. Rchb. ! non occurrunt; Bracteæ in D. vaginato et carthusianorum omnino similes sunt.
364. *D.* sylvestris, Wulf. Koch, Syn. p. 97. β. humilior, Koch, l. c.

caule plerumque unifloro, rarius bifloro, foliis rigidis. γ. alpinus, caule unifloro, vix ultræ 4–5″ alto, calyce colorato, corolla saturate rosea, et foliis tenuioribus. D. sylvestris, Rchb. exs !

H. β. inter Thermas Leucenses et Inden et prope Siders. γ. In alpibus supra Tæsch, copiose.

Obs. In Jurasso occurret frequenter var. α. Koch. l. c. caule elatiori facile bipedali et ultra, corolla rosea vel pallide carnea, et foliis linearibus angustissimis (cf. Wulf. in Jacq. Coll. i. p. 237,) arcuatim patentibus. Ad hanc varietatem pertinet, D. Scheuchzeri Rchb. forsan etiam D. caryophylloides, Rchb. et D. virgineus, Rchb. et auct. D. sylvestris. γ. imbricatus, Gaud. (a Rchb. ad D. virgineum citatus) est potius forma monstruosa vars. α : exemplaria a cl. Chaillet prope Neocomum lecta caule pedali et ultra non ut apud Rchb. "humili palmari-spithameo" gaudent.

365. *Silene* otites, L.

H. In apricis ad viam inter Varen et Siders, in valle D. Nicolai.

366. *S.* quadrifida, L.

H. In saxosis humidis, M. Gemmi supra Kandersteg.

367. *S.* rupestris, L.

H. In saxosis M. Gemmi supra Schwarrenbach ; et inter St Nicholas et Zermatt.

368. *Lychnis* Flos-jovis, Lam.

H. In apricis ad viam inter Stalden et St Nicholas.

Spergula Bartl. Ord. Nat. p. 302.

Calix 5 sepalus. Petala 5 integra. Stamina 5–10. Styli 3–5. Capsula 3–5 valvis, polysperma. Semina exarillata. Folia stipulata, stipulatæ scariosæ. Spergula, L. excl. sp. exstipulatis. Arenariæ, L. sp. stipulatæ. Arenaria Sect. Spergularia, Pers. DC. Alsine Rchb. Alsine auct. sp. stipulatæ. Alsine sect. Spergularia, Koch.

Obs. Numerus partium fructificationis Alsinearum in uno et eodem individuo valde variabiles est, et sicut genera hodie constituta sunt, nisi numerum stylorum et capsulæ valvarum, nullum discrimen habitu vel notis inter Saginam, Spergulam, Arenariam et Alsinem, L. et auct. invenire potui. Capsula 5 locularis Spergularum in Hook. Brit. Fl. ed. 2da et 3tia p. 191, certe ex errore typographica orta. Capsula 6-valvis Spergularum in Lind. Syn. ed. 2da p. 48, et DC. Prodr. i. p. 394, vix in Spergulis veris stipulatis, et tantum rarissime in Spergulis exstipulatis occurrit. Genus forsan melius inter Paronychias locandum, cf. Bartl. l. c.

369. *Spergula* rubra mihi. Arenaria, L. Alsine, Wahl.

H. Ad viam inter Stalden et St Nicholas.

Arenaria.

Calyx, 4–5 sepalus. Stamina, 4–10. Styli, 3–5.

Capsula, 3–6 valvis, polysperma. Semina exarillata. Folia exstipulata.

Arenaria sp. exstipulatæ, Auct. Alsine sp. exstipulatæ, Auct. Sagina, L. Spergula sp. exstipulatæ, Auct. Sagina, Alsine et Arenaria, Bart. l. c. p. 305. Sabulina, Arenaria, Sagina et Spergella, Rchb. germ. exc.

Obs. Plurima genera etiamnum huc forsan referenda. Holosteum-petalis dentatis differt. Mœhringia-seminibus arillato-appendiculatis. Stellaria-petalis bifidis vel bipartitis. Cerastium-capsula apice 8-10 dentata (Mœnchia et Malachium videnter vix a Cerastio distincta.) Cherleria mihi nondum satis cognita est, pro charact. vide Koch, Syn. et etiam cf. Griesselich kleine Bot. Schriften, I. Theil p. 332., ubi genera, habitu et notis satis distincta immerito conjuncta sunt.

Genus ita constitutum in sectiones constantes dividere haud facile est. Arenaria rubella, Hook. occurrit capsula 3–4–5 valvi : in exempl. meis Scoticis 5 valvi, in Norvegicis " Alsine rubella, Wahl !" 3 valvi. In Arenaria saginoidi (Spergula, L.) β. glaciali mihi, capsulæ occurrunt 4–5–6 valves.

Scct. I^ma. *Sabulina,* (Rchb.)
Capsula plerumque 3 valvis.

370. *Arenaria* laricifolia, L.

H. In umbrosis ad viam inter St Nicholas et Zermatt.

371. *A.* verna, L. β. diffusa, Gaud.

H. In M. Gemmi supra Kandersteg.

372. *A.* recurva, All. β? viscosa mihi, minor, ubique viscoso-pubescens, floribus duplo minoribus, foliis minus arcuatis.

H. Ad moles glaciales M. Schwarzseeberg. β. supra Tæsch.

Obs. Radix lignosa, longissima. Icon. All. Ped. Tab. lxxxix. f. 3. Nimis rudis habitum male refert. Icon. Jacq. Coll. i. Tab. xvi. f. 1. melior, sed corollæ forsan majores.

373. *A.* mucronata, DC. Gaud. Alsine rostrata, Koch, Syn. p. 114.

H. In arvis et incultis saxosis ad moles glaciales supra Zermatt.

Obs. Planta speciosa omnino a sequenti diversa. Caules e basi ramosissimi, prostrato-ascendentes ; folia tenuissima setacea ; flores speciosæ sequentis vix minores ; sepala acutissima æqualia, marginibus late-scariosis, et nerva dorsali viridi tenui, tertia vix parte corollam superantia, in planta florenti patentia. Flores, e sepalorum marginibus scariosis, pulcherrime eburnei. Semina rugoso-

dentata duplo majora quam in sequenti. Omnino accedunt nostra specimina ad sp. Gallica. Huc forsan pertinet A. fastigiata, Sm. Eng. Fl. ed. 2da, p. 310, sed "Alsine, No. 870, Hall. Hist. tab. xvii. f. 2." omnino ad sequentem pertinet, ut e descriptione, icone (planta laxa) et præsertim localitate patet; sed Spec. Scotica nondum vidi, et e descr. Smithii recedunt "stems erect, straight, densely corymbose; petals very short." Quoad plantam Gouani, dubilanter hæreo, quoniam illustrationes suas nondum vidi cl. Koch, in Syn. p. 114. Floram Britannicam Hookeri, confusione inextricabile, citavit.

374. *A.* Jacquini. (Alsine Jacquini, Koch, Syn. p. 115,) A. fasciculata, Jacq. (ex Koch, l. c.) Gaud. Alsine fasciculata, Koch, Deuts cl. Fl. iii. p. 288. Hall. Helv. No. 870, tab. xvii. f. 2.

H. In incultis vineisque prope Varen; in arenosis inter Siders et Leuk. (etiam occurrit in arenosis Jurassi.)

Obs. Caules e basi ramosi, rigide erecti, crassi; folia caulina basi lato-scarioso connata, rigida; flores axillares, corymbosique plerumque congesti, sepala anguste acuminato-pungentia, marginibus scariosis tenuioribus apicem non attingentibus, inter se inæqualia, etiam in planta florenti, erecto-clausa. Petala calyce triplo breviora, semina ut in præcedenti sed duplo minora.

Specimina omnino similia in Bavaria Rhenana prope Dürckheim legi, et etiam e Germania var. β. pubescentem ab am Wissmann accepi. Huc forsan pertinet A. fasciculata, Gouan, sed nomen Gouani valde confusum vix restituendum.

Sect. II^{da}.—*Sagina.* (Sagina, L. et Spergela, Rchb.)
Capsula plerumque 4–5 valvis.

375. *A.* saginoides, mihi. Spergula, L. Spergela, Rchb. α. diffusa, laxa segmentis calycinis obtuso rotundatis, foliis longioribus. β. ? glacialis, congesta dense cæspitosa, caulibus abbreviatis erectiusculis, foliis brevioribus et segmentis calycinis lanceolatis obtusis.

H. α. In graminosis humidis M. Gemmi supra Schwarrenbach. β. In glareosis ad moles glaciales M. Fünelen.

Obs. In uno et eodem individuo var. ά., capsulas multos 4 valves, plurimas 5 valves, et unicam 6 valvem inveni. Habitus a var. ά. valde absimilis, et forsan species distincta. In utraque varietate folia nondum mutica observavi.

Sect. III^{a}.—*Arenaria.* (Arenaria, Koch. Rchb. excl. sp. pl.)
Capsula plerumque 6 valvis.

376. *A.* ciliata, L. Koch. Wulf. *α.* Koch. A. ciliata *β.* multicaulis, Gaud. Wahl. excl. Syn. A. multicaulis, Wulf. L.

H. In M. Gemmi supra Kandersteg et Schwarrenbach.

Obs. Caules 7-flori et ultra ; petala calycem vix æquantia. Habitus A. serpyllifoliæ.

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377. *Cherleria* sedoides, L. *β.* brevifolia mihi.

H. Ad moles glaciales, M. Fünelen.

Obs. Folia vix lineam unam longa, dense rosulata, rigida stricta ; caulis subterraneus ramosissimus lignosus, salicem herbaceam æmulans. Flores breve pedunculato, capsulæ calycibus subduplo longiores. Florentem non inveni.

378. *Moehringia* polygonoides, M. et Koch. Deuts. Fl. iii. p. 272. Syn. p. 116. Arenaria polygonoides, Wulf ! in Jacq. Coll. i. p. 241. tab. xv.

H. In saxosis et glareosis ad nives perennes M. Gemmi, supra lacum Dauben, 31 Aug. 1836.

Obs. Semina nitidissima reniformia arillato-appendiculata omnino ut in M. muscosa, L.

379. *Stellaria* cerastoides, L.

H. In M. Gemmi supra Schwarrenbach, et ad moles glaciales M. Fünelen.

380. *S.* Nemorum, L.

H. In umbrosis saxorum in accensu M. Gemmi supra Kandersteg. 29 Aug. 1836.

Obs. Sterilis, caules prostrati valde stoloniferi.

381. *Cerastium* latifolium, L. Gaud. Koch, Syn. p. 123. Bentham, Cat. Pyr. p. 69. *δ.* subcaule, Gaud. Helv. iii. p. 250. C. latifolium, *δ.* glaciale, Koch, Syn. p. 123. C. glaciale, Gaud. Thomas exs. ! *ε.* ? pedunculatum, Koch. l. c. C. pedunculatum, Gaud. l. c.

H. In saxosis et glareosis humidis, M. Gemmi supra Schwarrenbach. *δ.* and *ε.* in glareosis ad moles glaciales M. Fünelen.

Obs. Ubique breve-glanduloso-pubescens : capsulas maturas formæ vulgaris non inveni. C. latifolium, Light. Hook. &c. et Britannorum certe ad C. alpinum et præsertim ad varietatem C. lanatum, auct. pertinet. In omnibus exempl. meis ex Alp. Clova, &c. Scotiæ. ab. am. Campbell, Barry, Brand, Greville, &c. communicatis, pili omnes eglandulosi sunt, sed pedunculi uniflori solitarii, ebracteati. Var. *ε.* habitu omnino a parietatibus præcedentibus recedit, et forsan vera diversa species, sed notas constantes non inveni. Folia lineari-oblonga, interdum 10 lineas et ultra longa ; pedunculi

solitarii, axillares terminalesque 1–2 unciales; petala calycem vix superantia angusta, bifida segmentis sabacutis; capsulæ subcylindricæ vix curvatæ calycem duplo et ultra longiores, vel interdum etiam breviores. Caules interdum abbreviati, interdum filiformes valde elongati.

382. *C.* arvense L. ? var. glaciale mihi, ubique cano-pilosum, foliis lineari-lanceolatis, ovato-lanceolatisve infimis minoribus.

H. copiose in graminosis ad rivulum glacialem valleculæ Tæsch.

Obs. Planta gracilis; caules pauciflores (2–5.) Pili longi eglandulosi patentes. Bracteæ marginibus late membranaceæ, pilisque longioribus ciliatæ. Habitu et primo aspectu, a C. arvensis forma vulgari facillime distinguendum.

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383. *Polygala* vulgaris, L. Rchb.

H. Ad viam inter Siders et Leuk.

384.* *Viola* pinnata, L.

H. Zermatt.

385.* *V.* arenaria, DC.

H. Zermatt.

386. *V.* biflora, *L.* α. innotata, petalis inferne saturatius luteis, nervis concoloribus percursis. β. notata, petalis inferne lineolis fuscis pulcherrime notatis, floribus minoribus.

H. α. ad nives deliquescentes, M. Gemmi. β. In fossis ad viam prope Randaa.

387. *V.* tricolor, L. γ. alpestris, DC. Prod. i. p. 303. V. tricolor, γ. saxatilis, Koch. V. tricolor subalpina, Gaud.

H. In pascuis alpinis prope pagum Fünelen supra Zermatt.

388. *V.* calcarata, L. α. vulgaris, foliis subrotundo-ovatis, vel oblongo-lanceolatis, crenatis vel integriusculis, utrinque glabris margine ciliatis. β. lancifolia, Roem! in Herb. meo. V. Villarsiana Roem et Sch.! foliis lineari-lanceolatis, lanceolatisve sinuato-crenatis utrinque minute pubescentibus ciliatisque.

H. α. In glareosis et graminosis, M. Gemmi supra Schwarrenbach. β. supra Zermatt.

Obs. α. variat magnitudine coloreque corollæ, et longitudine nectarii, caulescens vel subacaulis. β. variat ut præcedens caulescens vel subacaulis: corolla sæpius pallide cærulea.

389. *V.* cenisia, L. All. Ped. Tab. xxii. f. 6.

H. In saxosis et glareosis, M. Gemmi ad moles glaciales Lammerngletscher, 31 Aug. 1836.

Obs. Viola valderia, All. Tab. xxiv. f. 3. mihi diversa videtur.

Specs. in Herb. Roem. conservata majorem affinitatem cum. V. heterophylla Bertol. quam cum V. cenisia habent cf. Koch, Syn. p. 88, et Rchb. germ. exc. No. 4512 et 4513.

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390. *Helianthemum* Fumana, Desf.

H. In aridis inter St Nicholas et Zermatt.

391. H. alpestre, Rchb. Pl. Crit. i. ic. 2. H. ælandicum β. Koch.

H. In M. Gemmi supra Schwarrenbach.

392. H. vulgare, Gärtn. β. concolor. Rchb. Germ. exc. No. 4547.

H. In arenosis inter St Nicholas et Zermatt.

Obs. H. obscurum, Pers. huc a cl. Koch. altatum mihi videtur potius ad H. grandiflorum DC. referendum.

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393. *Arabis* perfoliata, Lam. Turritis glabra, L.

H. ad viam inter St Nicholas et Zermatt et inter Brieget Münster.

394. *A.* alpina, L.

H. In M. Gemmi supra Schwarrenbach ; et supra Zermatt.

Obs. Caules interdum unciales vix ultra, et subuniflori occurrunt.

395. *A.* arcuata mihi.

Arabis caule simplici pilis simplicibus hirsuto; foliis radicalibus obovato-oblongis sessilibus vel in petiolum attenuatis, caulinisque sessilibus lineari-oblongis integriusculis, pilis ramosis hirsutis; racemo erecto, abbreviato, pedicellis calyce (demum) vix longioribus; siliquis nervo prominulo tetragono-compressis anguste linearibus confertis arcuato-patentibus rigidis ; seminibus apteris impunctatis. A. ciliata β. hirsuta, Koch. Syn. p. 29. (excl. syn plur. ?) A. hirsuta incana, Gaud. Helv. iv. p. 315.

H. In glareosis, M. Gemmi ad nives perennes supra Schwarrenbach.

Obs. Caules sæpe numerosi, semipedales vix ultra, superne interdum glabri. Folia radicalia eximie rosulata pilis ramosis hirsuta et ciliata obscure dentata vel sinuata, caulina pauca remota integriuscula, superiora glabriuscula.

Racemus per maturitatem caulis partem vix quartam obtinens. Siliquæ nervosæ nitidæ lividæ arcuato-patentes et sæpius fere secundæ.

Syn. fere omnia dubia, dum auctoribus siliquæ erectæ strictæ semper descriptæ sunt, sed huc referendæ videntur, A. hirsuta sessilifolia β. alpestris. Gaud. l. c. Turritis alpestris, Schleich. A. incana, Rchb. germ. exc. No. 4341. Et forsan A. ciliata, auct. Helv. et germ. et Koch, l. c. ad formam glabram plantæ nostræ

etiam referenda ; sed hucusque exemplaria per pauca hujus plantæ examinare mihi licuit.

A. incana, Roth. Catal. Bot. i. p. 79, planta distinctissima potius ad A. auriculatam, Lam. vel ad A. saxatilem, All. referenda est : sub hoc nomine species diversissimas ex. gr. A. alpina, A. hirsutam, &c. accepi.

Proxime sane accedit nostra planta ad A. ciliatam, R. Br. (e loco ab. auct. Brit. citato " Hibernia, in arenosis maritimis prope Renvyle Cunnamara, exempl. permulta lege et examinavi) ; sed A. ciliata e toto glabra est, folia nempe tantum ciliata, subcarnosa ; caulis valde foliosus pedalis et ultra, foliis plerumque confertis, rarissime remotis. Racemus valde multiflorus, caulis partem dimidiam et ultra obtinens. Siliquæ erectæ latiores, longioresque strictæ, ad caulem plerumque appressæ ; pedunculi inferiores forsan longiores.

A stricta, Huds. A. collina, Ten.! et A. muralis, Bertol.! omnino diversæ sunt.

A arcuatæ exempl. permulta examinavi : imprimis legi : in Jurasso, in saxosis sterilibus summis, M. Tête de Rang, com. Neocomensi. In saxosis glareosisque ad nives perennes, M. Faulhorn, et in M. Gemmi, et accepi ab am. Guthnick e M. Steinberg, Vall. Lauterbrunn.

396. A. serpyllifolia, Vill? Gaud. Helv. iv. p. 310. Koch. Syn. p. 40.

H. In saxosis umbrosis prope Kandersteg.

Obs. Florentem non inveni, sed bene convenit cum exempl. a. b. Demarat e ditione Friburgensi missis ; paululum a descriptione Gaudini recedit, racemo magis conferto, et siliquis evidenter in stylo brevi attenuatis. Icon. Vill. Dauph. iii. p. 318. Tab. 37, certe plantam dissimilem refert, sed cl. Villarsius plantas suas sæpius mole depinxit. Sub nomine, A. auriculatæ plantam e Pedemontio accepi, quæ caulibus prostrates ramosissimis valde foliosis, siliquis brevibus crassoribus et magis patentibus melius ad diagnosim et iconem Villarsii accedit.

Nostra planta caulibus ad singula folia flexuosa-fractis debilibus, rosulis laxis, foliis ovalibus in petiolum attenuatis parvis plerumque integerrimis et seminibus apteris gaudet : et his notis, siliquisque multo angustioribus ab A. pumila, Wulf. qua non absimilis, satis differt.

397. A. pumila, Wulf.

H. In M. Gemmi in saxosis et ad rupes supra Kandersteg, et supra Schwarrenbach et lacum Dauben.

Obs. Siliquæ obscure carinatæ, semina pallide fulva ala pellucida pallidiori fere albida cincta.

398. A. bellidifolia, Jacq.

H. In uliginosis, M. Gemmi supra Schwarrenbach, 31 Aug. 1836.

Obs. Glaberrima, siliquæ evidentur carinatæ, semina fusca ala concolori vel paulo dilutius colorata.

399. A. cærulea, Wulf.

H. In M. Gemmi ad nives perennes.

Obs. Siliquæ evidenter carinatæ coloratæ, semina fulva ala paulo dilutius colorata.

400. *Cardamine* bellidifolia, L. *β.* alpina, DC. Gaud. c. alpina, Willd., Koch.

H. Ad nives deliquescentes, M. Gemmi.

Obs. Petioli in exempl. meis limbo interdum duplo longiores. Plantam lapponicam nondum vidi.

401. C. resedifolia, L.

H. ad moles glaciales, M. Fünelen.

402. *Sisymbrium* Sophia, L.

H. Ad viam inter St Nicholas et Zermatt.

403. *Erysimum* helveticum, DC. Fl. fr Syst. Veg. ii. p. 501, Gaud. Rchb et Germ. exc. No. 4395. E. palleus, *α.* foliis integerrimis, Koch, Syn. p. 53.

H. In Valesia vulgaris : ad viam in apricis inter Inden et Varen, et inter St Nicholas et Zermatt.

Obs. Ab hac specie abunde differt, Erysimum ochroleucum, DC. Fl. fi. Dub. Bot. Gall. i. p. 46. ; Gaud. Helv. iv. p. 366. ; Rchb. l. c. No. 4396. Cheiranthus ochroleucus, Hall. Dec. Syst. et Prod. Ch. decumbens, Schleich ! Caules decumbentes, ramosi, folia dentata, denticulata, caulina latiora petiolata glabriuscula. Flores facile duplo majores odoratissimi, petalis citrinis, ochroleucisve longe stipitatis ; siliquæ duplo longiores latioresque, subtorulosæ in stylum augustum ad duas lineas longum attenuatæ. Non intelligo qua ratione cl. Koch in Deutsl. Fl. iv. p. 694, et nuperrime in Syn. p. 53. has species sub nomine " E. palleus," Hall. fil. conjunxit. E. ochroleucum tantum in saxosis Jurassi, ex. gr. in M. Creux du Van ! Chasseral ! occurrit : E. pumilum, Gaud. Helv. l. c. Cheiranthus alpinus, Schleich ! vix ab. E. helvetico, DC. differt ; stylos semper evidenter et vix breviores inveni, et, me judici, mere forma nana alpina est.

Brassica, L.

Obs. Erucastrum Schimp. et Spenn : Koch, Deutscl. Fl. iv. p.

702, Syn. p. 56. Seminibus oblongis, vel ovatis compressis tantum *α.* Brassica, L. differt, quo genere semina globosa sunt: notæ certe nimis leves. Denominationes cl. Soyer-Willemet in Ann. des Sc. Nat. 2de Serie ii. p. 115 et seq. non retinui, quoniam Brassica erucastrum, Linnæi e sententia cl. Dec., Koch, Gaud., &c. inextricabilis est. Species ambæ a. cl. Koch, Rchb., &c. bene descriptæ sunt, et nominia trivialia ab iisdem proposita accepi.

Brassica Pollichii, mihi.

Br. foliis profunde pinnatifidis, laciniis oblongis inæqualiter obtuse dentatis sinu rotundato, sepalis petalisque (ochroleucis) erecti-usculis, siliquis patentibus rostro conico aspermo. Br. ochroleuca, Soyer. l. c. Br. erucastrum, *β.* ochroleuca, Gaud. Helv. iv. p. 301, Erucastrum Pollichii, Schimp. et Spen. Fl. Frib. iii. p. 946, Koch, l. c. E. inodorum, Rchb. germ. exc. No. 4428. Sisymbrium erucastrum, Poll. Pal. ii. p. 224, e. Koch. l. c.

H. In arenosis ad lacum Biennensem! Muratensem! Neocomensem! in insulis et in arenosis Arolæ prope Solothuru! et ad Rhenum prope Basileam. (Fischer!)

Obs. Valde variat forma foliorum. In exempl. fere omnibus (et ultra 200 examinavi) pedunculi infimi folio pinnatifido stipati sunt, sed etiam in exampl. sequentis " ad muros antiquos Huninguæ" lectes (Fischer!) bracteæ similes occurrunt. Petala videntur angustiora quam in sequenti, sed certe non " dimidio minores." Siliquæ magis distantes ac crassiores.

404. *Br.* obtusangula, mihi.

B. foliis profunde pinnatifidis, laciniis oblongis inæqualiter angulato-dentatis sinu rotundato; sepalis petalisque (citrinis) patentissimis, siliquis patentibus rostro toruloso plerumque monospermo.

B. erucastrum, Soyer. l. c. B. erucastrum *α*, Gaud. l. c. cum icone mala. Erucastrum obtusangulam, Rchb. germ. exc. No. 4429. Koch, l. c. Sisymbrium obtusangulam, Schleich! Dec. Syst. ii. 465. Prod. Dub. Bot. Gall. i. p. 44.

H. In arenosis ad viam prope Leuk, et inter St Nicholas et Zermatt.

Obs. Etiam quoad foliorum formam et loborum directionem variabilis; differt a præcedente etiam siliquis tenuioribus confertioribus ac magis numerosis. In exempl. meis pedunculi omnes aphylli. Rostra plerumque monosperma, interdum asperma.

405. *Eruca* sativa, Lam. Brassica Eruca, L.

H. In arvis incultis et ad viam prope Varen.

Obs. Siliquæ pilis paucis retrorsum hispidæ, interdum glabriusculæ, rostro scabro triplo longiores. Semina in exempl. meis, uni-

serialia, Petala citrina vel flava, venis fuscis picta, interdum purpurescentia, demum albescentia.

406. *Alyssum* calycinum, L.

H. In arvis ad moles glaciales supra Zermatt.

407. *Draba* aizoides, L.

H. (α.) in fissuris rupium, M. Gemmi, supra Schwarrenbach, (β) ad moles glaciales summi jugi alpium supra Tæsch in fissuris rupium. In M. Fünelen ad rupes M. Gemmi ad lacum Dauben, 31. Aug. 1836.

Obs. Planta valde variabilis (ut species fere omnes generis intricatissimi) et ε. varietatibus species plures ab auctoribus forsan male institutæ sunt. Formas sequentes distinguo.

α. microcarpa; siliculæ ovales vel suborbiculares $1\frac{1}{2}$ ad longæ 2 lineas longæ, pedicellis subsæquantes; racemus abbreviatus pauciflorus floribus parvis; folia lineari lanceolata brevia.

Variat siliculis lævibus et ciliatis, foliorumque latitudine et longitudine; semina perpauca, forsan abortione sæpissime uniserialia. Draba Sauteri Hoppe Koch, Syn. p. 62. Reich. pl. crit. iv. ic. 564-566 et exsic! (specimen immaturum) hæc varietate proxima, differt siliculis suborbicularibus, stylo per brevi, caulibus prostratis ramosis elongatis laxe cæspitosis, sterilibus remote foliosis; sed denuo indaganda, annon transitio occurrit.

β. intermedia; siliculæ lanceolate-ellipticæ, ad 3 lineas longæ, pedicellis æquales vel longiores; racemus congestus, floribus numerosioribus.

Variat ut var α; et in uno et eodem individuo stylos vix dimidiam lineam et ultra lineam unam longos inveni. Ad formam microstylam sine dubio referenda est Dr. Zahlbruckneri, Host. Koch, l. c. Rchb. exsic!—γ. macrocarpa; siliculæ lineari-lanceolatæ, lanceolatæve, 4-6 lineas longæ, pedicellis elongatis, breviores. Racemus multiflorus, demum valde elongatus, floribus magnis; folia linearia uncialia et sæpe ultra.

Hæc forma copiose ad rupes calcareas Jurassi ubique occurrit et cæspites maximos, interdum laxos efficit; variat etiam ut formæ præcedentes. Ab hæc varietate omnino differt Draba Aizoon Wahl! Dr. lasiocarpa Rochel! (omnino eadem species contra Koch, l. c.) foliis duplo triplove latioribus, pedicellis divaricato-patulis, stylo breviore, floribus duplo minoribus ochroleucis, calyibusque atroviridibus (in Dr. aizoidi flavescentibus) sed forsan calycis color variabilis. Var. α. facile in β. transit, et formæ intermediæ inter β. et γ. in Jurasso non desunt: pedicelli longitudo in uno et eodem individuo variabilis.

408. *D.* tomentosa, Wahl. Helv. p. 123, Tab. iii. Koch. Rchb. pl. crit. viii. ic. 1011–1014. exsic ! Gaud.

H. In M. Gemmi in fissuris rupium supra Schwarrenbach.

409. *D.* frigida, Sauter. Koch, Gaud. Rchb. l. c. iii. ic. 359, et exsic ! *α.* siliculis glabris. *β.* siliculis scabriusculis.

H. *α.* In M. Gemmi supra Schwarrenbach. * Zermatt. *β.* ad moles glaciales summi jugi alpium supra Tæsch.

410. *D.* Johannis, Host. Koch, Deutsl. Fl. iv. p. 553. Syn. p. 63. D. Carinthiaca, Hoppe. Rchb. pl. crit. iv. ic. 567–569, et exsic ! (differt tantum a suo nivali ! floribus paulo minoribus, et siliculis forsan longioribus, sed planta junior est.) D. nivalis Lapeyr ! Gaud. Helv. iv. p. 256. Rchb. l. c. viii. ic. 1045–1047, ex Germ. exc. No. 4238 et exsic !

H. Ad moles glaciales summi jugi alpium supra Tæsch cum præcedente.

Obs. *D.* muricella, Rchb. pl. crit. viii. ic. 1023–1025, a cl. Koch in Deutsl. Fl. l. c. ad D. Traunfellneri citata (in Syn. l. c. iconem Rchb. non citavit, sed D. Traunfellneri ad D. Johannis ducit) videtur omnino diversa. Sub nomine D. rivularis Berut plantam omnino similem ab Opitz accepi. Huc etiam de hirtam Gaud. l. c. pertinere opinor, sed plantam Gaud. nondum vidi. D. hirta, Wahl ! (c. Laponnica) diversissima est species, et icon. Rchb. bona. In Herb. meo spec. vallesiaca " Drabæ alpinæ, Liliebl." possideo qua satis bene ad iconem Rchb. D. muricellæ accedunt. D. muricella, Wahl ! videtur planta tantum minor, caulibus simplicibus. Draba rupestris R. Br. (Ben Lawers, Watson ! Campbell !) species mihi non satis cognita est. Inter specimina mea exempl. occurrunt stigmate sessili, et etiam stylo evidenter sed brevi : siliculæ tamen semper pilis stellatis furcatisque tectæ sunt.

411. *D.* lapponica, Willd. ? Rchb. pl. crit. viii. ic. 1019–1022. Koch, Syn. p. 64. D. fladnizensis, Gaud. l. c. ?

H. Ad moles glaciales summi jugi alpium supra Tæsch.

Obs. Forma silicularum paululo variat, sed quoad habitam et siliculas icon Rchb. optima est. In exempl. meis, folio sunt lanceolata, integra vel, et præsertim caulina, dentata, pilis stellatis ubique tecta, interdum longioribus simplicibus ciliata. Scapi 3–5 unciales unifoliati, inferne pilis stellatis adspersi, superne siliculisque glaberrimi. Siliculæ ovato-lanceolatæ vel ovatæ minimæ, stylo brevi sed evidenti terminatæ.

D. fladnizensis, Wulf. Rchb. pl. crit. viii. ic. 1016–1018. D. sclerophylla, Gaud. l. c. hæc proxima, differt habitu humiliori et crassiori, foliis lineari-lanceolatis glabris pilis rigidis simplicibus

subremotisque ciliatis, stigmate subsessili. Hanc plantam in M. Faulhorn copiose viget, et ibidem 1835–36 legi.

412. *D.* fladnizensis, Wulf. β? pubescens mihi. D. ramosissima, scapis nudis pubescentibus, foliis ovato-vel lanceolato-linearibus obtusiusculis, dorso exstante carinatis, pilis rigidis ciliatis, utrinque glabris: siliculis ovato-lanceolatis pedicellis longioribus, pilis simplicibus longiusculis tenuissimis pubescentibus, stylo brevissimo subnullo.

H. In fissuris rupium ad nives perennes M. Gemmi supra Schwarrenbach., (exemplaria 5 pro D. aizoides formam pussillam legi.)

Obs. Cæspites congestis parvos efficit; scapi vix semiunciales, interdum unifoliati, 2-5 flori: Florentem non inveni, ut dubitor annon potius ad D. Sauteri β. Spitzelii Koch l. c. referenda. Huc etiam referenda mihi videtur D. rupestris Rchb. germ. exc. No. 4245, (cf. ann.)

413.* *D.* confusa Ehrh. Koch. l. c. Gaud. l. c. Rchb. l. c. ic. 1033, opt. D. stylosa, Gaud! in Herb. meo.

H. in alpibus supra Zermatt.

Obs. D. lævigata, Hoppe, D. ciliata, Scop. Koch., l. c. mihi incognitæ.

414. *Biscutella* lævigata, L. Koch, Syn. p. 71.

α. siliculis glabris, lævibus. B. lævigata Gaud. DC. β. siliculis lepidoto-scabris. B. saxatilis, Schleich. Gaud. Dec. Rchb. pl. crit. vii. ic. 840.

H. α. inter Thermas Leucenses et Inden. β. ad viam inter Randaa et Zermatt, et in alpibus supra Tæsch.

Obs. B. lævigata, Rchb. l. c. ic. 837 et B. obcordata ejusdem ic. 836, siliculis superne non excisis differunt, sed in exempl, Rchb.! et in meis omnibus siliculas excisas inveni. In M. Bürglen dit. Bernensi plantam legi B. obcordatæ omnino simillimam, nisi siliculis superne excisis fere ut in icone Rchb. B. saxatilis, Schleich. In uno et eodem individuo siliculas valvulis superne stylo appressis (ic. Rchb. B. saxatilis, 840), vel a stylo remotis (ic. Rchb. B. obcordatæ, 836), observavi. In utraque var. semina omnino similia sunt et tenuissime punctato-rugosa. Variant foliis obovato-lanceolatis, lanceolatis vel lineari-lanceolatis remote inciso-serratis, sinuatis, vel sub integris, plus minusve hispidis.

415. *Hutchinsia* alpina, R. Br. α. major, diffusa caulibus elongatis ramosis foliosis, siliculis pedicello multo brevioribus, utrinque attenuatis, stylo conspicuo. β. brevicaulis, minor congesta, cauli-

bus abbreviatis erectiusculis, siliculis pedicello sæpe longioribus, obovato-obtusis, stylo brevissimo subnullo.

H. α. ubique frequens. In M. Gemmi ; supra Zermatt. β. ad moles glaciales M. Fünelen.—

Obs. In Herb. normali, Rchb. exs. ! plantam sub nomine. H. brevicaulis Hoppe possideo, sed specimen tantum florens pessimum (talio per sæpe in Herb. norm. Rchb. occurrunt) et admodum compressum ut non examinandum est ; sed vix dubitor. H. brevicaulis, Hoppe Koch. Syn. mere forma glacialis H. alpinæ est.

416. *H.* rotundifolia, R. Br. Thlaspi—Gaud. Koch.

H. In glareosis M. Gemmi ad moles glaciales Lammerngletscher, 31 Aug. 1836.

Obs. Siliculæ apteræ leviter emarginatæ, semina matura non habeo sed cotyledones videntur accumbentes.

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417. *Thalictrum* fœtidum, L.

H. In saxosis inter Inden et Varen ; inter St Nicholas et Zermatt.

418. **Anemone* vernalis, L.

H. Zermatt.

419. *A.* Halleri, All.

H. In graminosis, M. Fünelen.

420. *A.* alpina, L. β. sulphurea, Gaud. Koch.

H. In graminosis alpinis supra Tæsch.

Obs. Var. elatior pedalis macrantha, foliis profunde incisis hirsutioribus et humilioribus vix digitalis micrantha, foliis minus incisis hirsutisque.

421. *Ranunculus* glacialis, L. (γ. crithmifolius, Rchb.)

H. Ad moles glaciales in glareosis M. Fünelen :—rarissime in M. Gemmi ad nives perennes supra lacum Dauben. 31 Aug. 1836.

422. *R.* alpestris, L.

H. Ad nives deliquescentes, M. Gemmi.

Obs. Variat folio caulino trifido laciniis linearibus, et lineari-spathulato indiviso. Forma foliorum radicalium etiam variabilis, et non semper cæspitosa crescit, et, me judici, R. Tranufellueri Hoppe. Koch, Syn. p. 13, vix species diversa est.

423. *R.* parnassifolius, L.

H. Copiose in glareosis M. Gemmi : ad pedem rupium, M. Schalmette ;—et ad lacum Dauben.

Obs. Carpella ut in R. pyrenæo. Hæc est forsan var. parviflorus

sed florentem non inveni. Folia omnia supra ad nervos et margines plus minusve dense lanuginosa sunt.

424. **R.* pyrenæus, L. *α.* vulgaris, DC. Gaud.

H. Supra Zermatt.

Obs. Variat etiam foliis latioribus, cauleque bifloro—Transitus in var. *γ.* plantagineum, DC.

R. lacerus, Bell (*ε.* Vallesia et etiam *ε.* Pedemontio a cl. Balbis missa) omnino forma R. pyrenæi *γ.* plantaginei est, cui folia apice leviter vel profunde incisa sunt, et nullo modo proles hybrida, R. pyrenæi et aconitifolii.

425. *Aconitum* napellus, L.

Var. I. Hians, nectariis exsertis. A. Schleicheri, Rchb. Illust. Ac. Tab. I. f. 1.

H In ascensu M. Gemmi supra Kandersteg, 29 Aug. 1836.

Obs. Flores purpurascentes.

Var. II. Compactum, caule valde crasso, spica densa foliosa. A. Napellus compactum, Rchb. l. c. Tab. ii. f. 1. A. Napellus *γ.* bracteosum, Ser!

H. In M. Gemmi in glareosis humidis prope et supra Schwarrenbach copiose.

Obs. Variat foliorum partitionibus latioribus et angustioribus.

Var. III. Glaciale, pygmæum, foliis parvis tenuiter dissectis, inferioribus longe pedunculatis, spica pauciflora, nectariis inclusis. A. Napellus *δ.* pygmæum, Ser!

H. In glareosis M. Gemmi supra Schwarrenbach, copiose.

Obs. Videtur medium inter A. Schleicheri et Napellus compactum. Folia A. Schleicheri, Rchb. l. c. et spica fere A. Taurici, Rchb. l. c. Tab. lxlii. Hæc forma est forsan A. Tauricum Auct.

426. *A.* multifidum, Koch, Rchb. Ill. Ac. Tab. lxx. f. *α.* et h. opt. A. Napellus var. Koch, Syn.

H. In ascensu M. Gemmi supra Kandersteg, copiose in umbrosis. 29 Aug. 1836.

Obs. Caulis 4–5–pedalis, panicula laxa ramosissima floribus magnis speciosis.

427. *A.* acuminatum, Rchb. ?

H. In ascensu M. Gemmi supra Kandersteg. 29 Aug. 1836. rarius.

Obs. Flores speciosi, purpureo violacei, pedicelli erecto-patentes pubescentes, panicula simplex; folia ut in A. cernuo sed profundius et tenuiter dissecta, laciniis longioribus. Panicula et flores fere ut in A. multifido, Rchb. l. c. sed pedicelli longiores, et rostrum magis productum. Omnino medium inter Napelloidea et Cammaroidea.

In icone Rchb. A. acuminati, Tab. lxviii. (flos unicus) cassis multo angustior est quam in nostris : sed cassidis forma et præsertim rostri præ ætate variabilis est.

428. *A.* rostratum, Bernh.

H. In locis humidis umbrosis prope Kandersteg. 1 Sept. 1836.

Obs. Cassis minus curvata quam in icone, Rchb. Tab. xi. sed eandem formam et plantam iconi Rchb. omnino similem copiose in M. Stockhorn legi. Nectaria erectiuscula vel modice inclinata.

429. *A.* cernuum, Wulf. Rchb. l. c. Tab. xxxiii. et exsic. !

α. flexicaule, panicula laxa ramosa, ramis pedunculisque flexuosis.

H. In locis humidis umbrosis prope Kandersteg copiose, et in ascensu M. Gemmi supra Kandersteg. 29 Aug. 1836.

Obs. Occurrit carpellis ternis et quinis, glabris et etiam maturis pubescentibus ad formam carpellis pubescentibus pertinet A. hebegynum, auct. et etiam ad formam carp. pub. A. paniculati. Nectaria arcuato-cernuo.

β. pyramidatum.

H. In ascensu M. Gemmi supra Kandersteg. 1836.

Obs. Panicula ramosa magis coarctata ramis rigide erecto-patulis. A. paniculatum, Lam. Rchb. Ill. Ac. Tab. xxxii. videtur species distincta ; hujus formam hebygenam in M. Gemmi a cl. Seringe lectum possideo.

430. *A.* Lycoctonum, L. Var. Cynoctonum. A. Vulparia *β.* Cynoctonum, Rchb. Ill. Ac. Tab. lvii. opt.

H. In sylvis in ascensu M. Gemmi supra Kandersteg. 29 Aug. 1836.

Obs. In petrosis calcareis umbrosis Jurassi, A. Vulparia *γ.* Tragoctonum, Rchb. l. c. Tab. lviii. copiose viget.

III.—*An Attempt to ascertain the Fauna of Shropshire and North Wales.* By Thomas C. Eyton, F. Z. S.

The following attempt towards perfecting a Catalogue of the animals indigenous to Shropshire and North Wales was originally read before the Natural History and Antiquarian Society called after that district, the museum and meetings of which are at Shrewsbury. A few additions have, however, since been made. One of the principal objects for which this society was formed was to complete a list of the Fauna of the above-named district. Any steps towards its accomplishment, therefore, is so much gained. It is with this view

alone that I have offered the following Catalogue, however imperfect, as a sort of foundation to work upon, and have accompanied it with notes, where anything interesting, and not before recorded with regard to the habits or peculiarities of the species, presents itself, thus breaking in some measure the monotony of a mere list. It is my intention, also, to subjoin at the end of each class a notice of the extinct species, where there is good authority that they formerly did exist; fossil ones, however, will not be included. Introduced species will not be noticed, except in cases where they have, as it were, almost become indigenous.

Before commencing the catalogue of animals contained in the above-mentioned district, it will be perhaps interesting to many of my readers who live at a distance, to give some slight account of the face and general appearance of the country. As however, wherever soil, the geological formation or elevation appear to influence the distribution of a species, I shall particularly mention it when giving an account of that species, it will therefore be unnecessary to occupy much space here.

The surface of Shropshire is chiefly covered by the old and new red sandstone formation, traversed in a north-westerly direction by an eruption of trap or igneous rock, forming hills, the principal of which are the Wrekin, Ercal, Lileshall, Stretton hills, Longmynd, Stiferstone. There are also other hills in Shropshire of sandstone, which, although the trap does not make its appearance, are doubtless elevated by it. The principal of these are Grinshill, Timhill, Hawkstone, Nessoliss, and the hills in its neighbourhood. On the sides of the trap hills the rocks belonging to the silurian system of Mr Murchison are generally exposed to view; for a further account of which I must refer my readers to a series of papers read by him before the Geological Society, and to his forthcoming work on the geology of Shropshire. An extensive coal-field is found with the carboniferous series belonging to it, between Wellington and Shifnall, but the district occupied by it is far too thickly populated to be very interesting to the zoologist. Extensive peat bogs exist, particularly those of the Wild or Weald moors, running from Newport to the river Tearne at Crudington, the greatest breadth of which may be estimated at four miles, and Baggymoor or Boggymoor, traversed for its whole length by the river Perry, and extending from Halston to Ruyton. Of the eleven towns I have never been able to find any authentic account of animal remains having been found in either of them. Lakes or meres, as they are called, occur in consi-

derable abundance on the Welsh border, in the neighbourhood of Ellesmere. The far-famed river Severn traverses the county, to which most of its brooks and rivers are tributary.

The most extensive woodlands are those situated in the neighbourhood of the Wrekin and Ercal, a part of Bewdly forest, and the woods adjoining. The county would, indeed, altogether be called a wooded one, abounding with oak timber, and underwood.

Those parts of North Wales which bound Shropshire are chiefly composed of limestone hills, running far up into the principality, and of the Cambrian system of rocks of Professor Sedgewick. Various slates also occur, but no granite has as yet been discovered. A dike of trap has, however, lately been mentioned by Mr Wyatt to the Geological Society, discovered in the Penrhyn slate quarries. A large coal-field is found at Ruabon, and another smaller one at Chirk.

The whole of North Wales is thickly interspersed with lakes. From the summit of Snowdon alone, above thirty may be counted, and nearly every valley has its river. Many of the hills are partially clothed with oak and birch underwood, arising from stumps of ancient date, in many instances probably the remains of Druidical groves; in many also extensive plantations of the different sorts of fir have been made. The sea coast is extensive, and consequently a large proportion of marine animals are found.

On the gravel deposits of Shropshire and Wales, which being the uppermost, would probably in the greatest degree influence the distribution of species, a very interesting paper was read by Mr Murchison to the Geological Section of the British Association, to which, as the detail of it would far exceed my proposed limits, I must refer those who are interested with the subject.

The Brown Ace is the highest hill in Shropshire, (1805 feet above the sea.) There are others, however, which nearly approach it. The general level of the county may be said to be about 1000 feet lower. The summit of Snowdon is the most elevated point in North Wales, (3571 feet above the sea,) from which we find points of all heights to the actual coast.

Mammalia.

Vespertilio noctula, *Desm.* (Great Bat.) A specimen is in my collection, killed near the castle, Shrewsbury.

Vespertilio pipistrella, *Geoff.* (Common Bat.) Frequently occurs. I once found upwards of twenty congregrated together in a hole, by the side of a door-post, in the month of May.

Plecotus auritus, *Geoff.* (Long-Eared Bat.) In Shropshire this bat is decidedly more common than the preceding.

Erinaceus Europæus, *Linn.* (Hedgehog.) Common. It has been said that this animal feeds on eggs. Although I confined one for some time, and deprived it of other meat, I was unable to persuade it to touch one.

Talpa Europæa, *Linn.* (Mole.) Common. Albinos have several times occurred.

Sorex araneus, *Linn.* (Common Shrew.) Common.

Sorex fodiens, *Pall.* (Water Shrew.) An albino of this species is in my collection, captured near Shrewsbury ; and a paper will be found in Vol. ii. p. 219, of Loudon's Magazine of Nat. Hist., entitled, " Some account of the Water Shrew, a mouse supposed to have been lost for about a century, by John F. M. Doveston, Esq. A. M. Oxon of West Felton, near Shrewsbury," which gives the best account we have of its habits, and of its occurrence near that place.

Meles taxus, *Flem.* (Badger.) Formerly common in this county, but becoming more scarce every year. In North Wales, however, there are still plenty.

Mustela putorius, *Linn.* (Polecat.) Common.

Mustela erminea, *Linn.* (Stoat.) Common. Stoats will occasionally pursue moles in their burrows. A mole-catcher once informed me, that he had caught a mole and stoat in the same mole-trap.

Mustela vulgaris, *Linn.* (Weasel.) Common.

Mustela. (Martes, *Ray*.) Foina, *Linn.* (Common Marten.) North Wales. Not uncommon ; but I have never seen a Shropshire specimen.

Martes abietum, *Ray.* (Pine Marten.) Two specimens have been taken in Shropshire at Stapleton, near Shrewsbury. It also occurs in the neighbourhood of Snowdon, and near Barmouth, North Wales. That this and the foregoing species are not really distinct, I have scarcely any doubt. A specimen is now in my collection, which appears to be intermediate between the two. The test of anatomical character is, however, the only mode in which this can be determined.

Lutra vulgaris, *Desm.* (Otter.) A common animal on the rivers both of Wales and Shropshire. I once shot one with a ball near Holyhead at sea. He rose in the act of struggling with a large conger eel, no doubt with the intention of making a meal upon him. He appeared, however, to have quite as much as he could manage, the conger being coiled round him. The ball passed through the

heart of the otter, and head of the conger. The former I procured, but the latter, slipping through one of the boatmen's fingers, was carried off with the tide.

Canis vulpes, *Linn.* (Fox.) Common. A female in the possession of Edward Gataene, Esq. of Gataene, bred in confinement, having made an earth by scratching up a large flag-stone, her young, however, having been looked at, she destroyed them when two or three days old.

Phoca vitulina, *Linn.* (Common Seal.) Pennant, in his British Zoology, mentions the occurrence of this species on the coasts of Caernavonshire and Anglesea. The fishermen also have several times informed of its occurrence. I have never, however, succeeded in obtaining or seeing one. Mr Bell, in his "History of British Quadrupeds," page 263, mentions, on the authority of Professor Nilsson, that the oblique position of the teeth is a constant character in this species. It is, however, one which appears to vary with the age of the animal. In the cranium of a specimen in my collection obtained in Scotland, and of whose habits while alive some account was published in the first number of this Magazine, the two posterior molars are not oblique, and the third only slightly so. The fourth and fifth are, however, as represented in Mr Bell's work, page 268. The teeth in the lower jaw correspond with those of the upper, although a young one, which appears from the state of the ossification, and the total length being only 3 feet 4 in. It has no remains of milk teeth. The following particulars with regard to the skeleton may perhaps contribute towards the elucidation of the genus. The palatine bones are as figured by Mr Bell. Vertebræ, cer. 7; dor. 15; lum. 5; sac. 6; caud. 8; the tip of the tail was slightly injured, but I believe the enumeration to be correct. Ribs, 15.

Sciurus vulgaris, *Linn.* (Squirrel.) Common.

Myoxus avellanarius, *Desm.* (Dormouse.) In woods near the Wrekin, consisting chiefly of oak and hazel underwood, growing from old stumps, in which they make their winter quarters. The strokes of the wood-cutter's axe awake them, when, in their endeavour to escape, they are frequently captured. My specimens were obtained in this manner.

Mus messorius, *Shaw*, (Harvest Mouse.) A specimen is in my collection taken near Eyton.

Mus sylvaticus, *Linn.* (Long-tailed Fieldmouse.) Common during a late flood on the wild moors. I could have captured any number of these mice, every little tuft of grass that was tolerably

dry being full of them. When pursued they occasionally dived; they also ascended trees with the greatest facility.

Mus decumanus, *Pall.* (Norway Rat.) Common. An introduced species.

Arvicola amphibius, *Desm.* (Water Rat.) Common. This animal, like others of its genus, hybernates. There are numbers in the banks of the drains on the wild moors in summer, while in winter not one is to be seen.

Arvicola arvalis, *Flem.* (Field Vole.) In this neighbourhood, (Eyton,) this species frequents the banks of drains, and both swims and dives well. I have not yet met with A. pratensis, Baill. within the district.

Lepus timidus, *Linn.* (Hare.) Common. Several specimens of a whitish variety have also occurred.

Lepus cuniculus, *Linn.* (Rabbit.) Common. Black specimens are found occasionally on Rudge Heath, and in the neighbourhood of Eyton. A buff or yellowish variety is common near Longford Newport.

Phocæna delphinus, *Cuv.* (Porpoise.) Common on the Welsh coast in summer. The time of migration of this species would be worth the investigation of any one who had the opportunity.

Extinct Species.

Canis lupus, *Linn.* (Wolf.) The former existence of this animal is sufficiently proved by a mandate of Edward the First (quoted by Pennant) to Peter Corbet, to superintend and assist in the destruction of them through the several counties of Gloucester, Worcester, Hereford, Salop, and Stafford.

Castor fiber, *Linn.* (Beaver.) Pennant quotes Geraldus Cambrensis for the former existence of this species, who travelled through Wales in 1188, and states that in his time they were found in the river Teivi. Two or three waters in the principality still bear the name Lyn-yr-afange, or beaver lake.—*Ray.*

Mus rattus, *Linn.* (Black Rat.) Although I have not been able to find any notice of the present or former existence of this animal within the district, I have here inserted it, as it is most probable that it was an inhabitant before the introduction of its destroyer, the Norway rat.

IV.—*Observations on some New or Obscure Species of Plants.* No. II. By G. A. Walker Arnott, LL. D. F. L. S., &c. (Continued from page 247.)

Pentaloba, *Lour.* (Violaceæ.)

Dr Brown has long since demonstrated that Loureiro's genus and *Alsodeia* of Petit Thouars, were the same in every respect except the fruit, which Loureiro says is a five-seeded berry, but probably erroneously, as he had made another mistake regarding the ovary, to which he attributed five parietal placentæ, while Dr Brown finds only three in a specimen from himself. The description of the fleshy fruit may have arisen from its having been immature, in which state it is coriaceous and slightly fleshy in some, if not in all the species. I prefer, therefore, restoring the name given by Loureiro, to adopting that of *Alsodeia*.

All the East Indian species have a simple disk, as in De Candolle's first section of the genus, and the anthers destitute of bristles or hairs at the apex. I shall here add a short description of a new one from Ceylon, found there in spring 1836, by Dr Wight, and abridged specific characters of the others from India, which have been hitherto noticed by authors.

Sect. 1. Discus subcarnosus, dentatus vel subcrenatus, extus haud cingulatus. Filamenta inclusa, latiuscula, glabra. Antheræ apice imberbes.

1. P. *Ceylanica*, (Arn.;) foliis obsolete denticulatis axillis nervorum subtus eporosis, floribus fasciculatis, ovario styloque glabris. — *Wight. Cat. n.* 268.

Hab.—In insula Ceylano.

Fruticosa, glaberrima. Folia petiolata, petiolo $2\frac{1}{2}$-4 lineas longo, oblongo-lanceolata, obsolete denticulata, basi obtusa, apice attenuata, subtus eporosa. Flores fasciculati, axillares, brevissime pedicellati. Sepala ovato-lanceolata, acuta, ciliolata. Discus cupuliformis, simplex, 5-dentatus. Stamina 5, glabra, petalis breviora. Filamenta distantia, brevissima, anthera breviora, carnosa, e basi lata acuminata, intus ad disci dentes et paullo infra apices inserta ac illis opposita. Antheræ oblongæ, dorso in ligulam membranaceam erectam ovatam acuminatam loculos fere duplo superantem productæ ; connectivum apice cuspidulatum. Ovarium glabrum, ovato-globosum, discum paullo superans, uniloculare, ovulis tribus parietalibus appensis. Stylus erectus, conico-acuminatus, crassus, carnosus, glaber, staminibus paullo longior, petalis brevior. Stigma 3-lobum. Capsula coriacea, globoso-trigona, glabra, 3-sperma, styli basi mucronata. Semina globosa.

2. P. *Bengalensis*, (Wall.) foliis argute serrulatis subtus ad axillas nervorum excavato-ciliatis, floribus fasciculatis, ovario styloque glabris.—*Wall. Cat. n.* 4896.—Alsodeia Bengalensis, *Wall. in Act. Med. and Phys. Soc. Calcut.* vii. p. 224, (cum descriptione locupletissima.)

Hab.—In Bengala.

3. P. *lanceolata*, (Wall.) foliis lanceolatis longe attenuatis obsolete denticulatis subtus ad axillas nervorum eporosis, floribus congestim racemosis, sepalis late ovatis obtusis glabriusculis, disco 10-15-crenato, ovario styloque hirsutis.—*Wall. Cat. n.* 4023.—Vareca lanceolata, *Roxb. fl. Ind.* i. p. 648 ; *(ed. Wall.)* ii. p. 246.

Hab.—In Sincapore.

Folia 6-9 poll. longa, 1½-2 lata, breve petiolata, petiolo vix duas lineas longo. Pedunculus communis petiolo brevior ; pedicelli breves, erectiusculi. Sepala dorso glabra vel minutissime pubescentia, margine ciliolata. Discus cupulatus, brevis, truncatus, 10-15 crenatus. Stamina inclusa : filamenta linearia, planiuscula, lata, anthera sublongiora, glabra : antherarum appendix membranacea, ovata, acuminata, loculis dimidio longior.

4. P. *sessilis* (Lour.) foliis lanceolatis leviter serratis, floribus fasciculatis, sepalis lanceolatis pilosis, disco 5-dentato, filamentis corollam fere æquantibus, ovario styloque pilosis.—*Lour. Coch. (ed. Willd.)* p. 191.

Hab.—In montibus Cochin China ; *Loureiro.*

This species is obviously very closely allied to the last, but appears to differ by the hairy lanceolate sepals, and the disk. The above diagnosis is derived entirely from Loureiro's description.

5. P. *macrophylla* (Wall.) foliis oblongis vel oblongo-lanceolatis utrinque subacuminatis obsolete dentatis subtus eporosis, petiolis ramulisque hispidulis, floribus congestim racemosis, sepalis lanceolatis acutis extrorsum hispidis, disco subintegerrimo, ovario hispido, stylo glabro.—*Wall. Cat. n.* 4024 ?—Alsodeia macrophylla, *De Caisn. herb. Timor.* p. 100, t. 19.

Hab.—In insula Timor.—Penang ? ; *Porter ?*

Filamenta brevissima ; appendix antheram suam fere duplo superans, cordato-ovata, acuminata.

De Caisne does not quote *P. macrophylla*, Wall., nor am I acquainted with it ; perhaps the two plants are quite different.

Sect. 2. Discus submembranaceus 5-partitus. Filamenta exserta, capillaria, ad antheræ basin villosa. Antheræ apice imberbes.

6. P. *Roxburghii* (Wall.) foliis subsessilibus oblongo-lanceolatis crenatis basi cuneatis subtus ad axillas nervorum excavatis, floribus

fasciculatis, disci laciniis apice incurvo-bifidis filamento in incisura inserto, ovario glabro, stylo hirsuto.—*Wall. Cat. n.* 7189.—Vareca heteroclita, *Roxb. Fl. Ind.* i. p. 648; *(ed. Wall.)* ii. p. 246.

Hab.—In Hindustania; *Martin.*

Folia (in exemplo meo) 1-1¼ poll. longa, basi cuneata, subsessilia. Antherarum appendix lata, loculos parum superans, truncata.

Roxburgh says of the base of the filaments, that "each side is enlarged with one or more adjoined hornlets, which are bearded at the base." These hornlets are what I consider the lobes of the segments of the disk, and in the only flower, in a sufficiently advanced state, that I found on my specimen, they were quite glabrous, but the base of the anthers, or very apex of the filaments was woolly. I am not quite satisfied whether the disk is, as I have called it, only 5-partite, or whether it be not composed of 5 scales distinct at the base; they appeared slightly connected there, but separated with great facility.

In all the species which I have examined, there are only three ovules in each ovarium, one to each parietal placenta. I hesitate, therefore, in placing in the same genus *Vareca moluccana*, Roxb., of which the ovary is said to contain "many ovules attached to two or three parietal receptacles;" but that plant, as described, differs also from *Pentaloba* in several other important particulars, as in the want of stipules, villous peduncles, young shoots clothed with ferruginous pubescence, calyx 5-toothed, villous and caducous, and apparently no disk. Can it be a species of *Prosthesia* of Blume? a genus as already pointed out by Meisner (Plant. vasc. gen. Comm. p. 18,) very closely allied to *Pentaloba*, but differing by the numerous ovules. If so, Roxburgh's description must be considered as erroneous in several particulars. I feel, however, more disposed to refer it to *Pittosporum*, to which genus *Itea umbellata* Roxb., and *Celastrus verticillatus*, Roxb. appear also to belong.

Hortonia, *Wight MSS.*

Flores hermaphroditi? *Perianthium* seu *involucrum* e foliolis numerosis concavis imbricatis, exterioribus orbiculatis subcoriaceis persistentibus, interioribus subpetaloideis angustioribus tarde deciduis. *Stamina* circiter 7, perigyna. *Filamenta* brevia, basi utrinque glandula pedicellata cucullata truncata submembranacea stipata. *Antheræ* magnæ, suborbiculares, biloculares, adnatæ, extrorsum versæ, longitudinaliter? dehiscentes. *Ovaria* plurima in receptaculi plano parce piloso inserta, trigono-subulata, basi uniloculares. *Ovulum* solitarium, pendulum. *Stylus* nullus. *Stigma* obliquum, dilatatum,

compressum, membranaceum, sublacerum. *Carpella* (ovariis plurimis abortientibus) sicco-drupacea, breviter stipitata, ovoidea, compressiuscula, apice obliqua, unilocularia. *Semen* unicum, pendulum. "*Albumen* magnum, carnosum, haud ruminatum. Embryo minutus, in regione hili situs." (*Wight.*)

Frutex *magnus, glaber, Ceylanicus.* Folia *apposita, exstipulata, petiolata, oblongo-lanceolata, utrinque acuminata, integerrima, penninervia, sublus reticulata, epunctata.* Cymi *pedunculati, axillares, oppositi, petiolo longiores.* Involucri *foliola exteriora, atque pedicelli ramulique juniores minutim ac sparsim stellato-puberuli.* Flores *pallide flavi.*

1. H. *floribunda ; Wight, Cat. n.* 2467.

Hab.—In sylvis editioribus insulæ Ceylani, prope Newere Ellia, *Wight.*

"I dedicate this genus to Lady Horton, on account of the lively interest she takes in botany, and her extensive knowledge of Ceylon plants. It appears to hold a place intermediate between Magnoliaceæ and Anonaceæ,* having the numerous petals and large albumen, with minute embryo of the former, and extrorse anthers and distinct carpels of the latter, differing from both in its opposite and axillary inflorescence." (*Wight in litt.*) Dr Wight remarks, that there are 8–10 stamens, and numerous petals in several rows, 8–10 in each. I have, however, in no instance, observed more than seven stamens, and as for the petals or leaves of the perianth, there are not two situated in the same plane, all forming a dense spiral of several rows at the apex of the pedicel. I therefore consider the supposed floral covering more in the light of an involucre, and in this way *Hortonia* will obviously approach the Monimiaceæ. From these it differs principally by the imbricated æstivation, and definite stamens placed in a single series around the ovaria, and neither inserted into the tube of the involucre, but upon a flat receptacle or dilated apex of the pedicel. All the anthers which I have examined

* Belonging to the natural order Schizandraceæ, which does hold this intermediate place, I have received from Dr Wight, collected in Ceylon and Malabar (in 1836,) a species of *Kadsura*, differing only from the character of that genus, as limited by Blume, by having three ovules in each ovarium: it is *K. Wightiana* (Arn.) dioica, foliis obliquis ovalibus obtuse acuminatis supra medium denticulatis, pedunculis axillaribus femineis petiolo longioribus calyce (seu perianthio) 12-phyllo sub 4-seriali, filamentis discretis, ovariis 3-ovulatis, stigmate obliquo planiusculo ovato subpeltato, carpellis suborbicularibus obtusis mucronulatis.—*Wight, Cat. n.* 2478.—Pauslowia, *Wight in litt.*

Differt a *K. Roxburghiana* (quæ *K. Japonica*, Wall., *K.* altera species a Dunalis memorata, et *Uvaria heteroclita*, Roxb.) antheris haud immersis et ovario ; a *K. Japonica*, Kæmpf., si fidem descriptioni Thunbergiano ponas, plurimis notis.

had each cell marked along the middle with a longitudinal furrow, and contained pollen ; hence I infer that they are fertile, and open by slits (not by valves,) but I have seen none after dehiscence, and as at the same time they bear the closest resemblance to the staminodia of many genera of Laurineæ, so it is not improbable that they may be sterile, and that the fertile ones (on a different plant) do open by valves. If this view were to be adopted, *Hortonia* would be more allied to Atherospermeæ, particularly to *Laurelia* (the filaments of which are likewise furnished with a couple of glands at their base, as in Laurineæ,) but in all the Atherospermeæ the ovule is described as erect, not pendulous, and the style is long, persistent, and plumose. At present, *Hortonia* ought perhaps to be considered as a connecting link between Monimiaceæ and Atherospermeæ, agreeing with, but at the same time differing from both, in several of their peculiar characters. The flower buds, if they may be so called, resemble those of a double flowering myrtle, and are very frequently injured and internally deformed from having been attacked by the larvæ of insects.

In Lindley's Introduction to the Natural System, all the species of Monimiaceæ are said to be natives of America ; this is surely a mere inadvertency ; a very few only are found in the New World.

ACROCARPUS, *Wight MSS.* (Leguminosæ.)

Calyx subcoriaceus, ebracteolatus, campanulatus, 5-fidus, laciniis erectis, superioribus et inferiori cæteris paullo majoribus. *Torus* tubum tegens. *Petala* oblonga, subcoriacea, subæqualia, sessilia, diu persistentia, in ore calycis inserta ac ejus lobis alterna et paullo longiora ; æstivatio subimbricata, carinalis. *Stamina* 5, ibidem inserta, petalis alternantia : *filamenta* e basi lata subulata, petala 2–3–plo superantia, libera, recta : *antheræ* oscillatoriæ. *Ovarium* longe stipitatum, stipite libero, oblongo-lineare, falcatum, *stylo* brevi incurvo acuto mucronatum, multi (sub-15,) ovulatum. *Fructus*. . .

Arbor *magna, speciosa, glabra.* Folia *alterna, imparipinnata, decidua ; petiolus* 4–6 *poll. longus, teres : foliola* 3–4 *juga, lanceolata, acuminata, basi paullo inæqualia,* 3–*poll. longa, integerrima subtus pallida, petiolulo semipollicari.* Flores *ante foliorum evolutionem expansi majusculi, coccinei, racemosi ; racemis spiciformibus densifloris* 6–8 *poll. longis ; pedicellis lineam vel sesquilineam longis recurvis.* Stamina *fere pollicem longa.*

1. A. *fraxinifolius, Arn. in Wight Cat. n.* 2466.

HAB. Ad Courtallum, florens fere absque foliis mense Februario ; *Wight.*

This genus is allied to *Humboldtia*, as far as regards the number of stamens, and their insertion into the mouth of the calyx, but there the relation seems to end; for that genus, with *Jonesia* and a few others, form a small group distinguished by the stipes of the ovarium cohering on one side with the tube of the calyx; here it is perfectly free. I have not seen the fruit, but the ovary in many respects resembles that of several species of *Pongamia* and *Pterocarpus*. It seems, however, to belong to the second section of Cæsalpineæ of Decandolle, or third of Vogel, and to be more allied to the genera with a diminished number of petals, (*Crudya* and *Dialium*,) than to any of the others, on account of the simply pinnated leaves with a terminal leaflet. Dr Wight remarks, that the native name is Malle-vemboo-marum, meaning Hill-margosa tree, or *Azadarachta Indica*, to which it bears no resemblance whatever, except in being also a tree with pinnatifid leaves.

Another genus of the same group, but more allied to *Macrolobium*, I have received from Bahia by the kindness of M. De Lessert (No. 2567); it does not agree with any of those described by Vogel, and obviously differs from *Macrolobium* by the short (not very long) style, and nearly equal petals. If not already named by M. De Lessert, it may be called

ZENKERIA.

Calycis sepala 3 in tubum turbinatum connata; laciniæ subæquales, reflexæ. *Petala* 3, subæqualia, tubi ore inserta, obovata, basi attenuata. *Stamina* 3, fertilia, erecta, petalis alternantia, sepalis opposita; filamenta libera, glabra, apice subiter subulata; antheræ oblongæ, *Ovarium* stipitatum, compressum, pubescens, binovulatum. *Stylus* brevis, crassus, glaber, stigma depresso-capitatum, obliquum. *Fructus* . . . .

Arbor? *glabra*. Rami *teretes*. Folia *pinnata*, *foliolis* 4–5, *alternis*, *petiolatis*, *ovalibus*, *obtusis vel retusis*. Stipulæ *oblongæ*. Flores *fasciculati vel subcorymbosi secus basin ramulorum juniorum digesti*, *ante foliorum evolutionem expansi*. Pedicelli *flores æquantes*. Petala *alba*. Stamina *petala æquantia*. Stylus *ovario semiovali duplo brevior*.

1. Z. *dalbergioides*.

I have named this in honour of the late Professor Zenker of Jena, the genus of that name described by Trinius being the same with *Amphidonax*, N. ab E. in Lindl. Nat. Syst. p. 449 (excluding, however, *Arundo Bengalensis*, Roxb. the only species there referred

to, which appears to me neither to agree with the character given, nor to differ from *Arundo* of Kunth.)

Sphærocarya, *Wall.*

About six years ago, Dr Wight and I, while examining some of his East Indian plants which were in an imperfect state, found specimens of a pear-shaped fruit accompanied with some detached leaves, which we considered to belong to *Sphærocarya.* These we soon afterwards noticed in Jameson's Edinburgh Journal (for July 1832,) under the name of *S. Wallichiana* ; we had seen no flowers, but from the remains of them on the top of the fruit, we were induced to alter considerably the character of the genus, in so far as we conceived it to have no petals, but that the bodies so called by Dr Wallich were an exterior petaloid row of glands. Whether we were correct in ascribing this structure to the Nepal plant, the type of the genus, I have never been able to determine, not having been so fortunate as possess or even see specimens of it, but having now obtained flowers belonging to the peninsular species, I find that it must be separated from Dr Wallich's genus. In the Nepal plant there are said to be five persistent petals and alternating scales, (or perhaps a double row of scales, the outer petaloid, the inner minute,) and no disk ; in Dr Wight's there is a disk, but neither petals nor scales. Dr Wallich says, that the ovule is "erect, supported by a fleshy subdiaphanous spirally twisted cord, which rises from the bottom of the ovary, and is conducted into the oblong cell by means of a proper tube or canal ;" on which account *Sphærocarya* would be a doubtful member of Santalaceæ, (if the supposed erect ovule and fleshy cord be not in reality a more central column,) while the peninsular plant belongs, I should suppose, unquestionably to that order. I propose to call it

Scleropyrum, (Santalaceæ.)

Flores abortu dioici ? Masc. *Perianthium* ebracteolatum, 5-fidum, laciniis patentibus : tubus turbinatus, intus disco cupulato 5-lobo tectus. *Petala* nulla. *Stamina* 5, sepalis opposita, inter disci marginem perianthiumque inserta. *Filamenta* planiuscula, sepalis paullo breviora, apice bifida, segmento utroque antheræ loculum antice ferente. *Ovarium* (abortivum ?) disco immersum, uniloculare, (nunc fere solidum,) columella centrali carnosa cylindrica e basi loculi orta apice libera instructum. *Stylus* conicus crassus. *Stigma* 3-4-lobum, lobis erectis inæqualibus, duobus majoribus. Fem. Flores (fide Rheidei) ut in mare at tubo pyriformi.

Fructus drupaceus, pyriformis, monospermus, laciniis perianthii marcescentibus et disco coronatus. *Semen* sphæricum, hilo prope basin. *Albumen* carnosum. *Embryo* axilis, gracilis, semine dimidio brevior. *Radicula* supera.

Arbor *(Rheedeo teste) spinosa.* Ramuli *teretes, glabri.* Folia *glabra, alterna, exstipulata, breve petiolata,* 3½-6 *poll. longa,* 1½ 2½ *lata, supra lucida, ex ovatis obtusis in ovalia lanceolata, penninervia, nervis paucis subtus prominulis secus costam decurrentibus, ad axillas nervorum eporosa, integerrima.* Flores *subsessiles, dense spicati, spicis in axillis foliorum (sæpius delapsorum) subsessilibus, florentibus folio 3–4-plo brevioribus,* rachi *dense pubescenti,* bractea *minute lanceolata pubescente persistente sub quoque flore.* Flores *masculi illis* Pomaderridis *haud absimiles.* Filamenta *apice infra fissuram dorso, perianthiique laciniæ ad medium, villis albis paucis instructæ.* Drupa *basi in pedicellum brevem crassum attenuata.*

1. S. *Wallichiana,* Arn.—Sphærocarya Wallichiana, *Wight et Arn. in Ed. Phil. Journ.* (1832) xv. p. 180; *Wight, Cat. n.* 948. —Idu-mulli, *Rheed. H. Mal.* iv. t. 18, (fem.)—Tiri-itti-Canni, *Rheed. H. Mal.* vii. t. 30, (mas.)

Hab.—In Malabaria.

In all the flowers I have examined the stigmas appeared imperfect, and although the central column of the ovarium was slightly incrassated at the apex, I could perceive no trace whatever of ovules. I therefore consider them as unisexual, in which I am confirmed by Rheede, who says of his Tiri-itti-Canni, "fructus nulli:" in his Idu-mulli, or the fructiferous plant, no stamens are figured, but they are described; probably they are abortive. Rheede figures the female with thorns on the branches, but not the male, although he describes them. On my specimen there are none whatever, but it is the mere termination of a young branch. Rheede says of the male that it is a parasitical plant, of the female that it is a lofty tree: the former appears to me quite a misconception on his part. The figures he has given, the one of the male flower, the other of the fruit, are faithful.

Mackaya, *Arn.*

Calyx ebracteolatus, brevis, late campanulatus, limbo brevissimo 5-denticulato. *Corolla* subgamopetala, rotata, 5-partita, decidua, lobis oblongis calycis denticulis alternantibus; æstivatio valvata. *Stamina* 5, inter glandulas duas inserta prope basin corollæ laciniarum ac iis opposita. *Antheræ* sessiles, incurvæ, ovatæ, biloculares, longitudinaliter versus latera dehiscentes, connectivo crassiusculo.

Ovarium semiadhærens, uniloculare absque axi columellare centrali, partie libera conico-ovata in stylum brevem crassum sensim acuminata : *ovula* 3 ex apice loculi pendula. *Stigma* 3-lobum. *Fructus* omnino cohærens, oblongus, apice calycis denticulis styloque persistente coronatus, unilocularis, crustaceus, indehiscens, cortice (seu calyce) per maturitatem in valvas 3–4–5 ab apice ad basin subirregulariter delacerato. *Semen* unicum, pendulum. *Albumen* oleagineo-carnosum. *Embryo* minutus, in basi albuminis (sc. prope hilum) situs.

Frutex *glaber, scandens.* Folia *alterna, longiuscule petiolata, subpeltata, triplinervia, integerrima, ovata, apice attenuata, basi rotundata vel retusa, subtus glauca.* Pedunculi *graciles, dichotomi, pauciflori, axillares aggregati vel secus ramulum brevem axillarem aphyllum aut apicem versus oligo-phyllum alternatim dispositi, nunc in ramis junioribus axillares solitarii vel in axillis superioribus in cirrhos mutati !* Flores *longe pedicellati, magnitudine ac quodammodo facie eorum.* Myosotidis palustris *colore forsan albo.*

1. M. *populifolia*, Arn.—*Wight, Cat. n.* 2465.

Hab.—Ad Courtallum ; *Wight.*

Of this genus I cannot indicate the natural order, nor even the place in the linear series which it ought to occupy. In the structure of the ovarium it approaches Combretaceæ, but in that of the seed is very different from them. I hesitate whether or not the petals be not really distinct : they certainly do cohere by their margins at the very base, forming a kind of short tube, but when they fall off, they leave, not a continuous circular mark, but five distinct scars on the top of the fruit alternating with the teeth of the calyx : I can perceive no epigynous disk. One might suppose it a species of Olacineæ with inferior fruit, but it differs from the true genera of that order, as well as of Santalaceæ, by the want of a central columella to the ovarium : at the same time it is more related to these than to any other order at present characterized, and has as much right to be placed near them as some others usually referred there, but differing widely in their ovaria and fruit. In many respects it bears a relation to *Schæpfia*, a genus referred by Decandolle to Loranthaceæ, having a cup-shaped bractea under its ovarium, and said to have a trilocular ovary ; whereas here the calyx is naked at the base, and there is no trace of a central axis. In *Schæpfia arborescens*, however, the only species which I possess or have had an opportunity of dissecting, the ovary is unilocular, with three ovules suspended from the apex of a thick angular, but free central column, as in Olacineæ and Santalaceæ ; nor does it ap-

pear distinct from the latter except by the presence of a true corolla, or from the former except by the cohering calyx. Perhaps, then, notwithstanding the difference of structure of the ovary, *Schæpfia* and *Mackaya* may be linked together, and form a small (artificial?) group among the Calycifloræ, connecting Santalaceæ with them, as *Olax* does with the Thalamifloræ; a view which would be strengthened, if we were to consider with Dr Lindley, while speaking of Anthoboleæ, Nysseæ,* and Santalaceæ, that the superior or inferior fruit was a character of more importance than the position of the ovules. Without, however, granting this, for which I am not prepared, the two may be placed near each other, till other and better affinities be discovered.

I may here add with regard to *Schæpfia*, that although Vahl, (under *Codonium*,) and some other botanists, describe the ovarium as half-superior, that portion which is elevated above the margin of the calyx is perfectly solid and fleshy, and appears to me to be more an epigynous disk, similar to what is observed in many Rubiaceæ, than a part of the ovarium itself: the ovary is thus truly inferior, and this constitutes the principal objection to uniting the genus to Olacineæ. The ovules are narrow oblong, attenuated at their point of attachment, and reach from the apex of the columella nearly to its base, with the angles of which they alternate. In *S. arborescens* the style is cylindrical without any trace of furrows, and reaches to about the middle of the corolla; the stigma is capitate, and not at all lobed; it is, however, slightly flattened: the lobes of the corolla are recurved and acute, nor do I see how *S. flexuosa* is to be distinguished except by its rather narrower leaves. Vahl mentions that there is a small tuft of hairs on the corolla at the back of the anthers, which I perceive also in my specimen (from Bahia:) there thus seems to be no distinction in this respect between the American and Indian species; but in one of those from India, and probably in both, the stigma is clavate and 3-lobed, and the corolla infundibuliform, by which Decandolle's two sections may be characterized.

* The genus *Nyssa* differs from Santalaceæ not only in habit, but by the very large embryo nearly as long as the albumen, which is thin; the whole structure of the seed is not very unlike that of *Fagonia cretica*, and some other genera of the class Rutaceæ, as also of Euphorbiaceæ: In those species I have examined I have found only one ovule in the ovarium

REVIEWS AND CRITICAL ANALYSIS.

Dr Lardner's Cabinet Cyclopædia. Natural History. Natural History and Classification of Birds. By W. Swainson, Esq. A. C. G., F. R. S. L., &c. Vol. II. London, Longman and Co. 1837. (Continued from p. 461.)

We now pass to the tribe *Scansores* or climbing birds, "comprizing all those families whose feet are more particularly organized for climbing trees, and whose modification of structure have been already so fully explained" in a previous volume. With the exception of the *creepers* (*Certhiadæ*,) the whole tribe have their toes placed in pairs. The primary divisions are naturally arranged under the families *Certhiadæ*, *Picidæ*, *Psittacidæ*, *Ramphastidæ*, *and Cuculidæ*; and these, he observes, "collectively form a complete circle, the junction of the last with the Ramphastidæ being effected by the great hollow-billed genus *Phœnicophaus*, and by *Scythrops*, the Australian genus of toucans." The *certhiadæ*, which show the closest affinity to the *Tenuirostres* or suctorial tribe, are generally of a small size, with a bill of slender proportions as compared with other *Scansores*, but the hinder toe greatly developed. The subfamilies of this division are the *Anabatinæ*, with the tail slightly rigid, but never acute, the outer toes free; *Certhianæ*, having the tail terminating in sharp and often horny points; *Buphaginæ* with the bill thicker, and tail as in the first group, *Troglodytinæ*, the wrens, and *Sittinæ*, with a short and partially wedge-shaped bill, the toes greatly developed in proportion to the size of the body. From this family he has rejected the genus *Upupa*, Linn. which he now places among the *Promeropidæ*, as the tenuirostral form; as well as *Orthotomus*, which we have seen him introduce as a scansorial type among the *Sylvianæ*; and *Mniotilta*, which holds the same station among the American *Sylvicolæ*. The *Picidæ* which, from their structure, he considers to be the most perfect of the climbers, constitute the typical division of the tribe. Of its minor groups, the subfamily *Picianæ*, or true woodpecker, has been investigated with great suc-

cess, and its circle down to the subgeneric groups wonderfully worked out. The *Buccoinæ*, containing the genera *Asthenurus*, Sw. *Picumnus*, Temm. *Bucco*, Linn. and *Pogonias*, Ill. is another section, and it is probable the genera *Yunx*, Linn. and *Oxyrynchus*, Temm. may prove representatives of others. The *Psittacidæ*, or parrot form the third family, and subtypical division. Of these curious and beautiful birds, he justly remarks, that, if any group in nature be isolated, it is this. Possessing in themselves the strongest characteristics, there is no bird yet discovered which presents any point of connection to them. Approximations, indeed, are certainly made towards them by the tooth-billed barbuts, (Pogonias), but there is still a gap which no genus yet discovered is calculated to fill up.

The subfamilies, as indicated by the genera, appear to be the *Macrocercinæ*, *Psittacinæ*, *Plyctolophinæ*, *Lorianæ*, and *Platycercinæ*, under each of which he has in the Synopsis given the genera and subgenera, which do not essentially differ from the arrangements contained in the history of parrots, forming the sixth volume of the "Naturalist's Library." The *Ramphastidæ*, or toucans, represent the fourth family, a group remarkable for the enormous size and comparative lightness of their bills, a provision beautifully adapted for that excessive development of the olfactory organs which gives them the most exquisite powers of smell. The genera recognized are four, viz. *Ramphastos*, Linn. *Pteroglossus*, Ill., *Aulacorynchus*, Gould, and *Scythrops*, Lath. The cuckoos or *Cuculidæ* form the fifth and last family of the *Scansores*. This he divides into the subfamilies *Cucullinæ*, *Corryzinæ*, *Crotophaginæ*, *Leptosominæ*, and *Indicatorinæ*; but as our limits will not permit us to enter into further details, we refer our readers to the author's elaborate papers on this group, contained in the third and fifth numbers of this Magazine. We may, however, remark, that he conceives the necessary union between the scansorial tribe and the rasorial order of birds, is effected by certain species of the genus *Leptosoma*. The tenuirostral tribe or honey-suckers, which he considers the most aberrant division of the insessorial order, are principally distinguished by the structure of their tongue, which is always retractile and long, sometimes simply forked, but more frequently with the tip brush-like or filamentous; the feet and legs are generally small and slender, and the bill in the typical groups is so delicate, as to appear to be formed rather for the purpose of sheathing or defending the tongue, than for seizing or grasping food. The primary divisions are thus named from the generic types, *Trochilidæ*, *Cinnyridæ*, *Promeropidæ*, *Pa-*

radisidæ, and *Melliphagidæ*. Of these the two first are considered the typical and sub-typical divisions. In the Melliphagidæ we have a curious and highly interesting group, containing within itself, as he observes, types of every order and tribe throughout ornithology. By the *Ptiloris paradiseus*, or rifle-bird of Australia, it seems brought in connection with the *Promeropidæ*, while its smaller forms lead to the sun-birds or family *Cinnyridæ*, the typical groups of which are natives of the tropical regions of the old world. In these birds the margins of the bill are minutely dentated, the tongue forming a bifid tube, but the tip without the filaments or brush-like appendage of the Melliphagidæ.

In the *Trochilidæ* or true humming-birds he remarks, "we have the full development of the suctorial perfection belonging to this tribe." As a group they still remain in a degree isolated, no immediate connecting link with the other families having yet been discovered, though there is obviously a strong affinity between them and the Cinnyridæ; and in the large species lately discovered, we are inclined to think a close approximation to the Promeropidæ will be found to exist. He determines the five principal forms under the generic heads of *Trochilus, Cynanthus, Lampornis, Campylopterus*, and *Pœthornis*. We now arrive at the last tribe of the Insessores, which, from the great width of the gape of its members, has been named the tribe of *Fissirostres*. As a whole, Mr Swainson observes, "they are distinguished by having the powers of flight developed in the highest degree; all energies of their nature seem concentrated in this one perfection; for their feet are always very short, weak, and generally so imperfect as to be of no further use than to rest the body after flight. Their food is insects captured upon the wing." The primary divisions are supposed to be the families *Caprimulgidæ, Hirundinidæ, Meropidæ, Halcyonidæ*, and *Trogonidæ*.—Among the *Bee-eaters, Meropidæ*, we find the Rollers, genus *Coracias*, which by former systematists used to be placed among or near to the crows. That the present is their natural station, no one, we think, who has investigated their structure and economy, as well as their immediate affinity to the genus *Eurystomus* will be prepared to doubt. Among the Halcyonidæ he properly places the puff-birds or members of *Tamatia*, and its sub-genera, an extensive group, which, in systems where natural affinities and economy were either little understood, or not attended to, used to figure among the *Cuculidæ*. The jacamars, also, (*Galbula*), which at one period were placed close to the hornbills, he has transferred to their proper station in this family. That the Trogons, whose situation hitherto has

been a subject of much doubt and discussion, actually form a portion of the fissirostral tribe, an examination of the species, as well as what we know of their habits and economy, has satisfied us, although some links may be wanting to render their connection with the other groups of a closer nature than it is at present. With the Trogons he associates the Motmots, (*Prionites*, Ill.,) which also possess a serrated bill; by some of the species such as *P. platyrynchus*, and a beautiful recent introduction *P. superciliaris*, a decided affinity to the Meropidæ and Halcyonidæ is indicated.

The gallinaceous birds, or order *Rasores*, next claim attention; but as our analysis has already extended to an inconvenient length, we must confine our remarks to a mere notification of the primary groups of which it and the two remaining orders seem to be composed. The rasorial families are the *Pavonidæ*, *Tetraonidæ*, *Struthionidæ*, *Columbidæ*, and *Cracidæ*, or as he afterwards names it in the synopsis *Megapodidæ*. Of these five the two first are the typical and subtypical divisions. The analogies of the rasorial birds with the ungulated quadrupeds, respecting which we have already stated our opinion, are given in the following table.

Pavonidæ	Solipedes
Tetraonidæ	Ruminantes
Cracidæ	Anoplotheres
Columbidæ	Edentates
Struthionidæ	Pachydermes

The connection of this order with the Insessores through the medium of the Scansores, its analogue, he endeavours to prove, and we think successfully, to be effected by certain birds of the family Cuculidæ, such as *G. Crotophaga*, *Leptosoma*, and the *Coccyzus Geoffroyii*, and not by *Musophaga* or *Corythaix*, as supposed by Cuvier and other writers; the affinities of the last mentioned genera clearly indicating them to belong to the Conirostral, and not to the Scansorial tribe. A few additional observations on the affinities of the gallinaceous birds closes this chapter.

The Grallatorial order, or wading-birds, comprises, in Mr Swainson's words, "all such families as live both on land and sea, and to whom one element is as essential as the other." The families or primary divisions of the waders are supposed to be comprehended under the following heads; *Ardeadæ*, *Charadriadæ*, *Scolopacidæ*, *Rallidæ*, and *Tantalidæ*. Among the *Ardeadæ*, he places the Cranes, which we were inclined to consider as a distinct family, and that his family *Tantalidæ* entered within the circle of the *Ardeadæ*; our views, however, we confess, may have been errone-

ous, as our investigation of the contents of this order has not been of that minute character to enable us to speak confidently of its affinities and analogical relations. The order *Natatores*, or swimming birds, closes the great ornithological circle, and is composed of such families as habitually live upon the waters. They are characterized as having feet short in proportion to the size of the body, generally placed behind the equilibrium, with toes rather long, and more or less united by a thin membrane or web, and with the exception of the waders, are the only order which have the neck considerably longer than the legs. The five great divisions which are supposed to constitute the natural families of the order, are the *Anatidæ*, *Laridæ*, *Pelecanidæ*, *Alcadæ*, and *Colymbidæ*; of these he considers the two last, from the great development of the natatorial powers, to be the primary types, but adds, that further investigation is required, before the analogies of its primary groups can be satisfactorily determined; at present, he supposes them to stand thus.

Families of Natatores.	*Tribes of Insessores.*	*Orders of Birds.*
Colymbidæ,	Conirostres,	Insessores,
Alcadæ,	Dentirostres,	Raptores,
Pelecanidæ,	Fissirostres,	Natatores,
Laridæ,	Tenuirostres,	Grallatores,
Anatidæ,	Scansores,	Rasores;

and though not fully convinced of the truth of his positions, we must confess, his arguments in their favour are ingenious, and of considerable weight. Among the Anatidæ, whose circle, in some of its minor divisions, as that of the *Anatinæ*, has been successfully worked out, he places those singular birds, the flamingoes, *G. Phœnicopterus*, a transportation from the grallatorial order in which they were left by other writers, but for which change, judging from what we have seen of these birds, both as to structure and habits, he has good grounds for doing. It thus, as an aberrant form, becomes the grallatorial type of the Anatidæ, and forms that link by which the Natatores are united to the Grallatores. Of the families *Colymbidæ*, *Alcadæ*, and *Pelecanidæ*, much remains for further examination, and he merely points out the known genera of each. The Laridæ or gull family, including the terns, gulls, albatrosses, skuas, and petrels, is the fifth and last; the circle being closed by the subgenus *Pachyptila*, Forst., which, in the form of the bill, indicates a near approch to the family of the Anatidæ. Among the *Laridæ* he has also placed the genus *Dromas*, Payk., the representative of which is figured and described in the "Illustrations of Ornithology," under the title of *Erodia Amphilensis*; but we cannot think Mr

Swainson's views in regard to this curious bird are correct, its form and structure apparently bringing it much closer to some of the grallatorial families, and we can only attribute its present station to the circumstance of the author never having seen or examined a specimen.

The concluding half of the volume is occupied with "a Synopsis of the Natural Arrangement of Birds," in which the whole of the orders, families, and other minor divisions are arranged in that series, which the latest researches of the author indicate to be most in consonance with their direct affinities, and consequently with that order which they occupy in nature. Upon an inspection of this synopsis, it will be observed, that the distribution of the groups in some cases is different from what they appear in the text, but this, he observes, "has resulted from further analysis, and by incorporating his researches up to the latest time." These changes, indeed, are mostly of minor importance, that is, they do not interfere, or are at variance with the principle of his arrangement, being mostly confined to such forms or groups as had not previously undergone a searching analysis, or which, as osculant species, and showing a double affinity, it was difficult, without additional information, to locate in the groups to which they are in reality most nearly allied. The nomenclatural department, it will be seen, has undergone considerable change; several new genera have been added, and many generic and specific names introduced by other writers have been altered. With the first class we find no fault, so long as the forms present characters of sufficient importance to warrant generic distinction. With the other, though we do not approve of all the innovations introduced, we nevertheless think the names are generally, as being more classic in their derivation, preferable to those for which they are substituted; and further, that an author is justified in making such changes whenever the rules of nomenclature, as laid down by the 'fathers of science,' have been palpably violated or neglected, otherwise it is impossible a system of classic nomenclature can ever be established or insured. Upon quitting this part of the volume, we shall just glance at one or two forms, whose situation, if not inappropriate, we at least deem doubtful, with the limited information at present possessed of their habits and economy. The first is that of his *Catheturus Australis*, (the Alectura or New Holland vulture of Dr Latham,) which he places among the Vulturidæ, of which family he considers it the rasorial type, though he had previously assigned that station to the *Dodo* of authors,—a bird of whose existence at any period, under the form generally represented, we have always been very sceptical. Our own impression, from a mi-

nute examination of skins of Catheturus, is, that it belongs to the rasorial order, and will enter the family named *Cracidæ*, or now by Mr Swainson, *Megapodidæ*. Its exterior characters certainly appear more nearly allied to the rasorial than the raptorial forms—the bill, though strong, being in shape essentially that of a gallinaceous bird, with nostrils partially protected by a superincumbent scale. The tail, as the generic name first given it clearly imparts, is strictly rasorial, and the legs in structure closely approach those of some of the birds with which we would associate it. Of its habits and mode of living, upon which much depends, we unfortunately know little or nothing. A second is that of the genus *Chionis* or sheathbill, which he has placed as a form in the family *Columbidæ*, but whose affinities require to be better understood before its real station can possibly be determined. The cranes, genus *Grus*, &c. we still think entitled to a rank of higher value than that of a subfamily of *Ardeadæ*. It will be observed that the genus and its subgenera have been altogether omitted or forgotten in the synopsis. Of the present situation of the genus *Hæmatopus*, we also have considerable doubts, and believe that it will be found to belong to a different division of the Grallatores. Of the affinity of *Dromus*, the last genus of the synopsis, we have already stated our opinion.

Having at length brought our observations to a conclusion, we take our leave of Mr Swainson, with feelings of gratitude for the lasting benefit he has conferred upon science. He has in the volumes now published given us a system or arrangement of two of the great classes of vertebrate animals, which, if not yet perfect in all its details, has, nevertheless, its great outlines and demarcations based upon fixed and important principles, proving it to be infinitely superior to any that has before been attempted, and more in accordance with, or more nearly approaching, the natural system. He has, we think, successfully carried out the views and principles of that eminent naturalist, which were first disclosed in the pages of the *Horæ Entomologicæ*, and, in addition, has announced, and we think gone far to prove, the existence of other important natural and general laws. That much remains to be done to render the arrangement perfect in all its parts and minor details, we freely allow; it is indeed a matter of time, and must occupy years to accomplish. Day after day, however, new objects in every department of natural history are being brought to light. These, so far from increasing our difficulties, must essentially diminish them, as we may naturally expect to find, among the variety discovered, forms which we wanted to fill up those links of the chain which at present are imperfect or disjointed.

Bibliographical Notices.

Tentamen Pteridographiæ, seu Genera Filicacearum, presertim juxta venarum decursum et distributionem exposita. Auctore Carolo Bor. Presl. Pragæ, 1836, 8vo. pp. 290.

Although published in 1836, this very interesting work has only just come in our way, and we hasten to bring it under the notice of our readers. As the title indicates, it is an attempt to determine the genera of Filices, according to characters mainly derived from the venation of the frond.

"Dignitas vasorum seu nervorum venarumve," observes the author, "in dignoscendis plantis jam eo usque cognita est, quod ex contemplatione illarum in foliis diversissimis plantæ monocotyledoneæ a dicotyledoneis facile discerni possunt. Dispositio nervorum vel venarum in laminis foliaceis indicat compagem organorum, in quibus obvenit, et cum dispositione vasorum in truncis et petiolis contentorum arctissimo cohæret vinculo. Hæc vasa in organis foliaceis Filicacearum tamquam costæ, venæ et venulæ palam fiunt et ex supra allatis causis maximum in describendis dividendisque Filicibus possident argumentum. Filicaceæ compage venarum anatomica ab omnibus aliis vegetabilibus phanerogamis quam maxime differunt; hac ex causa venæ Filicacearum characterem essentialem et validissimum ex interna structura harum plantarum desumtum præbent."

The work is illustrated by twelve folding plates filled with a great number of accurately drawn and beautifully executed figures, exhibiting the venation and fructification of the genera. Perhaps M. Presl has in some cases pushed his principle a little too far, and formed genera of groups which might have been retained with advantage as sections. The number of new genera amount nearly to fifty! There is no doubt that venation has been too much neglected, and that henceforth it will be held of primary importance in defining the genera of this large and beautiful family.

Bryologia Europæa seu Genera Muscorum Europæorum Monographice illustrata. Auctoribus Bruch et W. P. Schimper. Fasc. 1. cum. Tab. xi. Stuttgartiæ, 1837. 4to.

This is the first part of an entirely new work upon the Mosses of Europe, and, if completed according to the plan proposed, will form a valuable addition to our botanical libraries. The generic and specific characters are in Latin; the observations in French and German. Every species is figured, and the well-executed plates abound

with those minute details (drawn by the authors themselves,) for which the German naturalists are celebrated. The present fasciculus contains the PHASCACEÆ and BUXBAUMIACEÆ. The second and third fasciculi, containing the ORTHOTRICHACEÆ, illustrated with twenty plates, are probably already published. Each monograph is perfect in itself, and may be purchased separately. We recommend the work to the attention of all muscologists.

Encyclopædia Britannica. Edited by Professor NAPIER. 4to. Black and Co. Edinburgh. *Article Mammalia,* &c.

THOUGH an Encyclopædia scarcely comes under the range of a Magazine devoted to Zoology and Botany, yet works of this kind often contain so much information on physical science, and have held such an important station in the literature of almost all countries, that we think ourselves bound to direct attention to the articles devoted to natural history, and more particularly as these can now be obtained bound up apart from the great work itself. The Encyclopædia Britannica is now in the course of publication by an enterprising Edinburgh bookseller, having the various departments, independent of the superintendence of an enlightened general editor, placed under the charge of men whose names are a guarantee for the accuracy and merit of the essays which fall under their review. The zoological department has been entrusted to Mr James Wilson, author of the "Illustrations of Zoology;" and there has already appeared, in addition to shorter and less important articles, *Entomology, Ichthyology,* and *Mammalia.* The first, being the favourite pursuit of its author, has perhaps had the most pains bestowed upon it, and forms an excellent introductory treatise on this branch, occupying a complete half volume. Ichthyology runs through nearly a hundred pages; and the last article, Mammalia, occupying a hundred and twenty pages, forms a good and concise exposition of the Cuvierian system, which has been adopted in both the latter branches, "rather than that of any more modern, or it may be amended classification," which from "critical asperities have scarcely in themselves subsided into a lucid or tranquil element of science."* Most of the latest discoveries have been introduced in their proper places, and the treatise will be found to contain a summary of what was known up to the date of publication. The engravings, generally copies from the standard illustrated works, both British and foreign, are well executed, and in the three departments, amount to forty-eight in number.†

* Mammalia, pages 84 and 88

† Mammalia 17, Ichthyology 11, Ertomology 20.

INTELLIGENCE.

Miscellaneous.

Botanical Society.—1837, November 9th.—Professor Graham, President, in the Chair.—The following members were elected: *Resident*, Mr A. H. Balfour; Mr James Crossfield; Mr Alexander Dempster. *Non-resident*, Mr C. E. Broome of Rudloe; Mr Samuel Holker Haslam, of Chesham; Mr John Sheer, Aberdeen. *Foreign*, M. S. Bischoff, Berne; M. George Dolliner, Vienna; M. F. Glocker, Berne; Dr Oswald Heer, Professor of Botany in the University of Zurich; M. Albert Kolliker, Zurich; Dr Francis Lagger, Fribourg; Rev. Christian Münch, Basle; M. Charles Naegeli, Zurich; M. Phil. Max. Opitz, Prague; M. L. Rabenhorst, Luckau; M. J. L. Schaller, Fribourg; M. R. Schartow, Berne; M. C. Sinz, Berne; Professor John Bernh. Wilbrand, Giessen.

Specimens were presented from Sir William Jardine and twenty-four members of the Society, received since 13th July last, along with various donations to the library from Professor Wilbrand, Mr J. T. Mackay, Professor Heer, Mr R. J. Shuttleworth, Mr P. J. Brown, M. P. M. Opitz, and Mr R. W. Falconer, &c. &c. The thanks of the Society were given to Dr Greville, Dr Balfour, and Mr Brand, for their exertions and trouble in collecting for the Society, a large stock of Alpine duplicates, chiefly from the mountains of Forfarshire and Aberdeenshire.

Mr R. W. Falconer exhibited a specimen of *Celosia cristata* raised from seed, in the open air, in a garden near Bath, which by frequent transplantation had attained to a great size. This plant is a native of Japan, where Thunberg says the crests or heads of flowers are often one foot in length and breadth, but that when removed from their native soil they rapidly degenerate. The flower in the specimen shown measured 2 feet $4\frac{1}{2}$ inches from side to side, and 1 foot $2\frac{1}{2}$ inches across, and was one of twenty equally large.

Dr Balfour read an extract from a letter which he had recently received from Mr W. B. Carpenter of Bristol, wherein Mr Carpenter mentioned that, on tracing up the reproductive system, from its simplest appearance in the lowest cryptogamic to its most specialized form in the highest flowering plants, he was inclined to think

that there is no essential change in its character throughout the vegetable kingdoms, although the organs become progressively more complicated, the lowest and simplest, however, possessing all that is essential in the highest. Mr Carpenter intimated his intention of making these views ere long the subject of a paper to be sent to the Society.

Dr Graham exhibited drawings, and gave an account of several remarkable forms of trees which he had recently seen and examined. 1. In the M'Nab burying-ground at Killin, a small Scotch fir (*Pinus sylvestris*) is suspended from one much larger, by adhesion to its side. The suspended tree is alive both above and below the point of union, and is of considerably greater diameter below that point than above it. Notwithstanding a legend regarding it, that thirty years ago, in a gale in February, a branch was broken from a neighbouring tree, and stuck in a cleft in the one here alluded to, Dr Graham thinks it quite certain that the suspended tree had grown on the steep bank adjoining, and, lying against its neighbour, had formed a union with it, whilst its own roots were yet in the ground, and then, having been detached from the soil, remained suspended, and lived by the fluids obtained through the point of union. 2. The apparent union of a horse-chestnut and beech at Cambusmore near Callander. A branch from the horse-chestnut lies across the stem of the beech, and is pinched tightly in the acute angle formed by the stem, and a large branch proceeding upwards from it, so as to be completely imbedded and covered, with the exception of a narrow strip of the bark along the upper side of the branch, which remains exposed. Dr Graham is satisfied that there is no transfusion of fluids from the beech to the horse chestnut, not even organic adhesion between them, and he feels assured that the branch will die as soon as it is completely enveloped by the beech. 3. At Gargunnock House, Stirlingshire, two elm trees, (*Ulmus montana*) grow near to each other, so near that they might be supposed to arise from the opposite sides of a considerable stem, felled many years before. Between these, and a little to one side, is the stem of an ash tree, less than half the diameter of either of the elms; and in the centre are three stems of holly, two of which are certainly portions of one tree, but whether the third is a distinct tree or not, it was found difficult to determine. At their bases, all these are so intermingled and so imbedded in each other, that it is scarcely possible to believe that no organic union subsists between them. One of the holly stems has died; and another appears to be fast going to decay,—for having become wholly imbedded in the

elm, its bark must be destroyed, and no power left of transmitting its elaborated fluids to the roots. All the other trees are perfectly healthy, and together form a top which at a distance seems one well-shaped handsome tree.

December 14th.—Professor Graham, President, in the chair. The following members were elected :—*Resident,* Mr Herbert Giraud, Mr David Graham, Mr John Thomas Syme, Mr Emanuel Young. *Non-Resident,* Dr Robert Hibbert Taylor, Dumfries. Mr Robert Graham was appointed Local Secretary at Liverpool, and Dr Gilbert M'Nab in Jamaica.

The Chevalier Giovani Gussone of Naples was proposed by the Council, and elected a *Foreign Honorary Member.*

Specimens were presented from Dr Greville, Mr Percy, Rev. A. Rutherford, Mr Edwin Lees, Dr Tyacke, Rev. W. S. Hore, Mr J. Cruickshank, Mr William Reid.

Dr Greville presented a beautiful design for a diploma, for which the thanks of the Society were unanimously given to him.

Dr Greville then read a " Notice of a Botanical excursion to the Highlands of Forfarshire and Aberdeenshire." Dr Greville left Edinburgh on the 16th of August, accompanied by Dr Balfour and Mr Brand,—one of the principal objects of the party being to collect specimens of the rarest Scottish plants for the Botanical Society. The party proceeded by Dundee to Airlie, and from thence to the head of Glen Isla, which forms a part of the richest botanical mountain district in Scotland. About three miles from Dundee the true *Rumex aquaticus* of Linnæus was observed to be not unfrequent, the only station for which plant in the British islands, hitherto recorded, being near Ayr, where it was discovered by Mr Goldie. In Canlochen, one of the glens which terminate the head of Glen Isla, were found *Thlaspi alpestre, Gentiana nivalis, Alopecurus alpinus, Phleum alpinum, Poa alpina, Erigeron alpinus, Dryas octopetala, Veronica alpina, V. saxatilis, Epilobium alsinifolium, Saussurea alpina, Sonchus alpinus, Juncus castaneus, Carex atrata, Salix lanata,* besides numerous other rare species in which this glen abounds, and which so remarkably characterize and distinguish it from Caness, the other terminal branch of Glen Isla,—the latter being as unproductive in the scarcer alpine plants, as the former has been shown to be the reverse. From 19th to 25th August, the head-quarters of the party were fixed at the hamlet or Kirktown of Clova, near the head of the valley of the South Esk, from whence excursions were made to Glen Dole, Glen Phee, Loch Brandy, &c. and a large accession of plants made to those already

collected,—including *Lychnis alpina, Astragalus alpinus, Linnæa borealis, Sonchus alpinus, Pyrola rotundifolia, Carex rariflora, C. Vahlii, Salix arenaria, S. reticulata, Hieracium alpinum, Lycopodium annotinum, Azalea procumbens, Isoetes lacustris, Cerastium alpinum, Oxytropis campestris, Woodsia hyperborea, Weissia latifolia, Didymodon glaucescens,* &c. From Clova the party removed on the 25th, proceeding by Glen Dole, the White Water, and Glen Callader to Castleton in Braemar, where they remained till 1st September, making excursions in the interval to Glen Callader, Loch-na-gar, Ben-y-bourd, &c. Specimens were obtained of *Carex rupestris,* discovered in Glen Callader in August 1836 by Mr Dickie; also *Carex Vahlii, C. pauciflora, Juncus castaneus, Alopecurus alpinus, Saxifraga rivularis, Stellaria cerastoides, Arabis petræa, Cornus Suecica,* &c. Dr Balfour found a new station for the rare *Saxifraga rivularis* on Ben-y-bourd. On 1st September the party separated, Dr Greville and Dr Balfour recrossing the mountains to Airlie, on their way to Edinburgh, Mr Brand proceeding by the summit of Benmuickdhui, the highest ground in Scotland, (in order to gather *Luzula arcuata*) to Inverness. It is worthy of remark, that *Rumex aquaticus,* which was one of the first plants met with, was observed to prevail throughout the whole of the district traversed, and even to be found in abundance by Mr Brand in Morayshire, about Peterhead, &c. During the excursion the party suffered occasionally from severe cold, attended with storms of wind, rain, and snow; but, in the conclusion of his narrative, Dr Greville observes, that it "was probably, taking all things into consideration, the most productive one ever made in the Highlands of Scotland. The number of specimens procured cannot, I think, fall short of 15,000, and it only remains for me to express a hope, that, as far as the Botanical Society is interested in the result of our labours, its expectations will not be disappointed."

Dr Balfour exhibited a *Carex* transmitted to him by Dr Murray of Aberdeen, which had been found by Mr Dickie in August 1836, on rocks near the summit of Loch-na-gar. Dr Balfour stated that, on careful examination, it appears to him to be *Carex leporina,* Linn, Willd. and Flor. Dan., *C. lagopina,* Wahl., and *C. Lachenalii,* Schk. a species never before found in Britain. The *Carex leporina* of Huds., Leers, Lightf., Ehrh., and Wahl., is merely a synonym of *C. ovalis,* Gooden.

Dr Pollexfen exhibited specimens of *Delesseria ruscifolia, Rhodomenia Palmetta,* and *Bonnemaisonia asparagoides,* found by him last summer in Orkney, and all new to the Scottish Flora. Also

Nemalion lubricum, Duby, (*Chordaria nemalion,* Agardh,) found by Miss Watt at Skaill, Orkney, being a new genus to Britain. Lastly, a new species of *Striaria,* found by Dr Pollexfen in Kirkwall Bay, Orkney, which he proposes naming *S. Grevilliana.* It is chiefly distinguished by its irregular ramification.

Dr Graham read some remarks on a paper published by Dr Wight, in the Madras Journal, (No. 13, p. 300,) which paper contained a commentary on a letter from him to Dr Wight, regarding the gamboge tree of Ceylon. In this paper Dr Wight mentions that Dr Graham differs from him by having made the following statements: 1*st,* That the plant sent to him from Ceylon, and which he (Dr G.) has since named *Hebradendron gambogioides,* is the *only one which produces gamboge fit to be used in the arts;* 2*d,* That the *Hebradendron gambogioides* is the plant which yields the *true* Ceylon gamboge; 3*d,* That Drs Wight and Arnott were mistaken when they asserted that the *Xanthochymus ovalifolius* is the only *indigenous* plant in Ceylon that produces gamboge fit to be used in the arts; and 4*th,* That *Hebradendron gambogioides* is a *native* of Ceylon.

Dr Graham showed, by reading the extract from his letter which Dr Wight himself had published, that he never made one of these statements, except the second, the accuracy of which he is quite prepared to maintain, having proved, by his own experiments and those of others, that the concrete juice of *Hebradendron gambogioides* is excellent gamboge, chemically, medicinally, and as a pigment,—and knowing from the perfectly unexceptionable authority of Mrs Walker that it is collected in large quantity in Ceylon. The first statement Dr Graham not only never made, but it is opposed to the opinion which he actually holds; although information, he thinks, is still required on the subject. On the third point there is a threefold error. Dr Graham never maintained that Drs Wight and Arnott had asserted that *Xanthochymus ovalifolius* is the only *indigenous* plant in Ceylon which produces good gamboge. They asserted that it is the *only plant* in Ceylon which does so; but Mrs Walker has enabled Dr Graham to prove that there is *another.* He is now farther able to assert that the concrete juice of *Xanthochymus ovalifolius cannot* be employed advantageously as a substitute for gamboge. The fourth statement Dr Graham never made, and indeed, until lately, he had no information upon the subject; but recent letters from Mrs Walker, he thinks, now entitle him to say that the *Hebrandendron gambogioides* is *indigenous* in Ceylon,—at any rate certainly enable him to disprove the assertion upon which was founded Dr Wight's opinion that it is not.—W. H. C. *Sec.*

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—— 166, —— 22, *for* country, *read* county.
—— 167, —— 17, *for* do. *read* do.
—— 169, *at* Table 8, *for* 681 genera, 286 species, *read* the reverse.
—— 328, line 24, *for* Fig. 1, *read* Fig. 2.
—— —— —— 26, *for* Fig. 2, *read* Fig. 1.
—— 384, —— 12 and 18, *for* Mr Bald, *read* Mr Ball.
—— 429, —— 27, *for* jerkins, *read* perking.
—— 433, —— 7, *for* Toomavarat, *read* Toomavara.
—— 488, —— 10, *for* Tridactylites, *read* Trifurcata.

END OF VOLUME SECOND.

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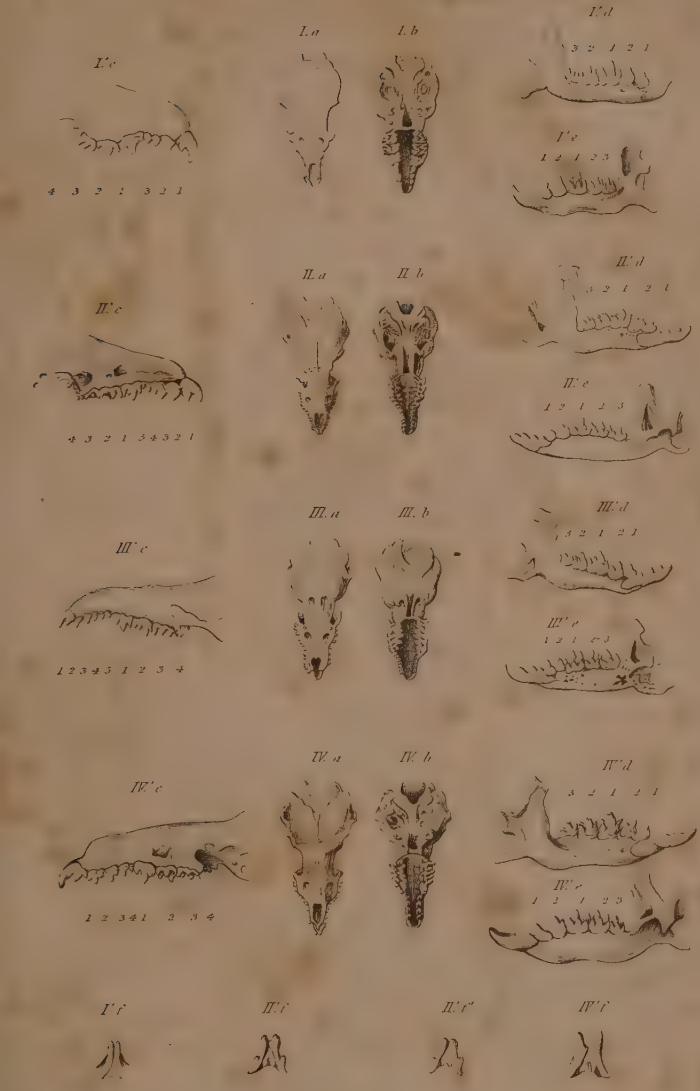
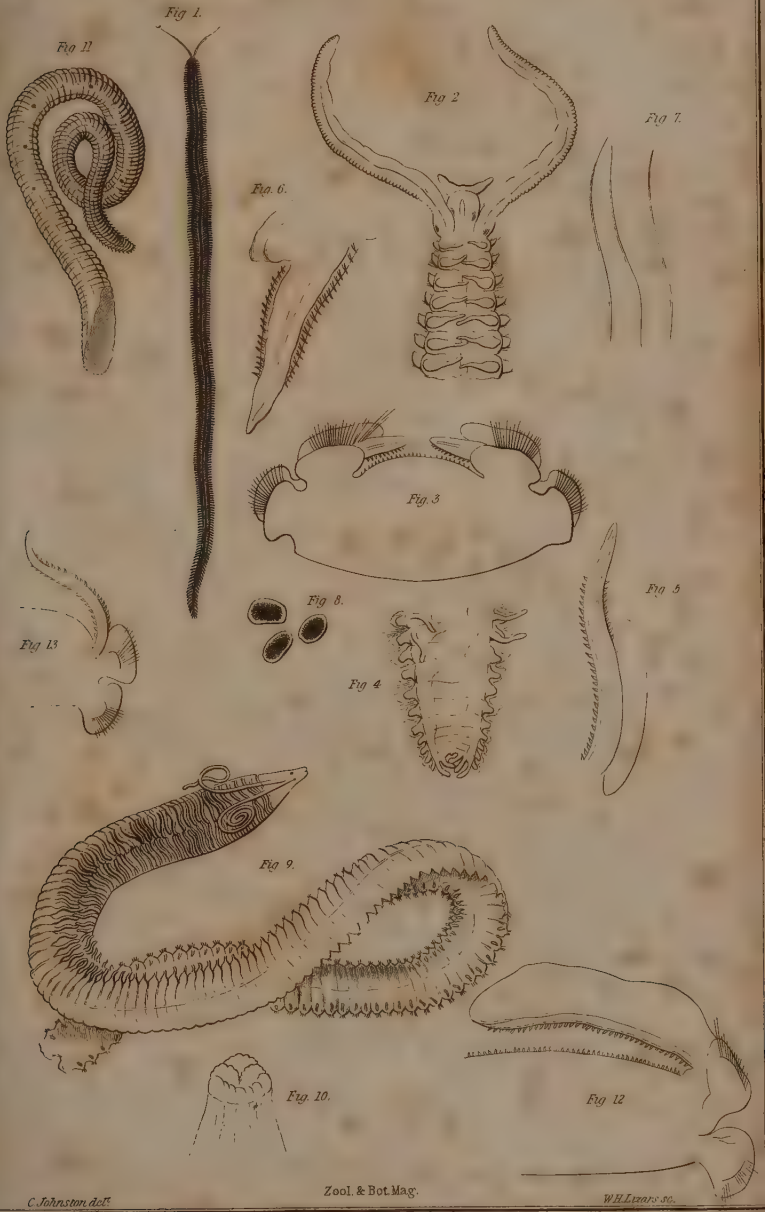
PLATE 1.



I. Sorex Aranæus of Duvernoy. II. S. Aranæus of English Authors.
III. S. Fodiens of Duvernoy. IV. S. Fodiens of English Authors.

Drawn by Mr. Curtis del. 1837 *W. H. Lizars sculp.*

PLATE II.



C. Johnston del.

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W.H. Lizars sc.

PLATE III.

Fig 1

Fig 2

Fig. 3.

Fig 4

Fig 5

Fig 6

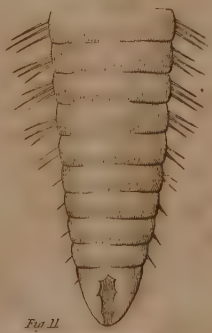
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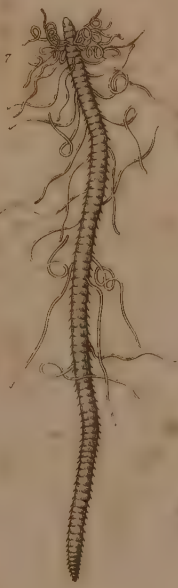
Fig 11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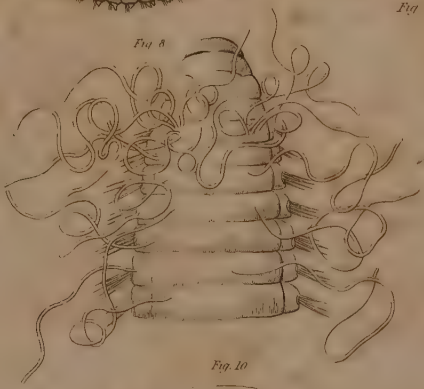
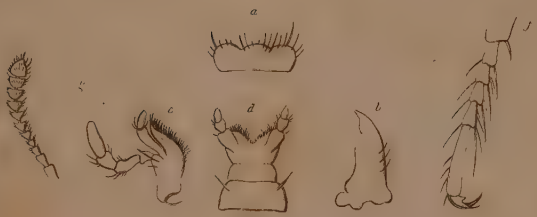


Fig 8

Fig 10

Fig 9.

Fig 1



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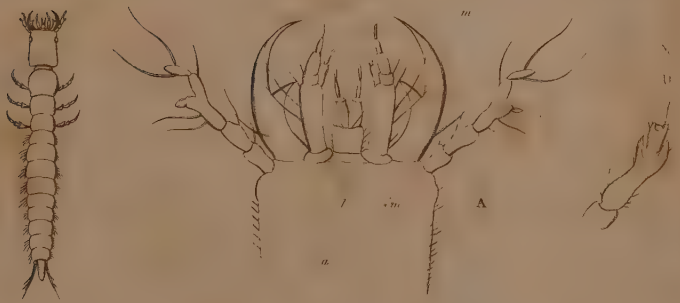

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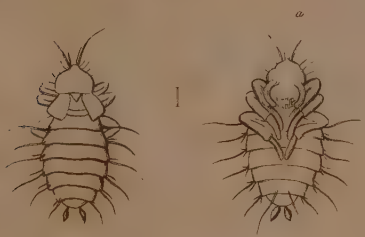
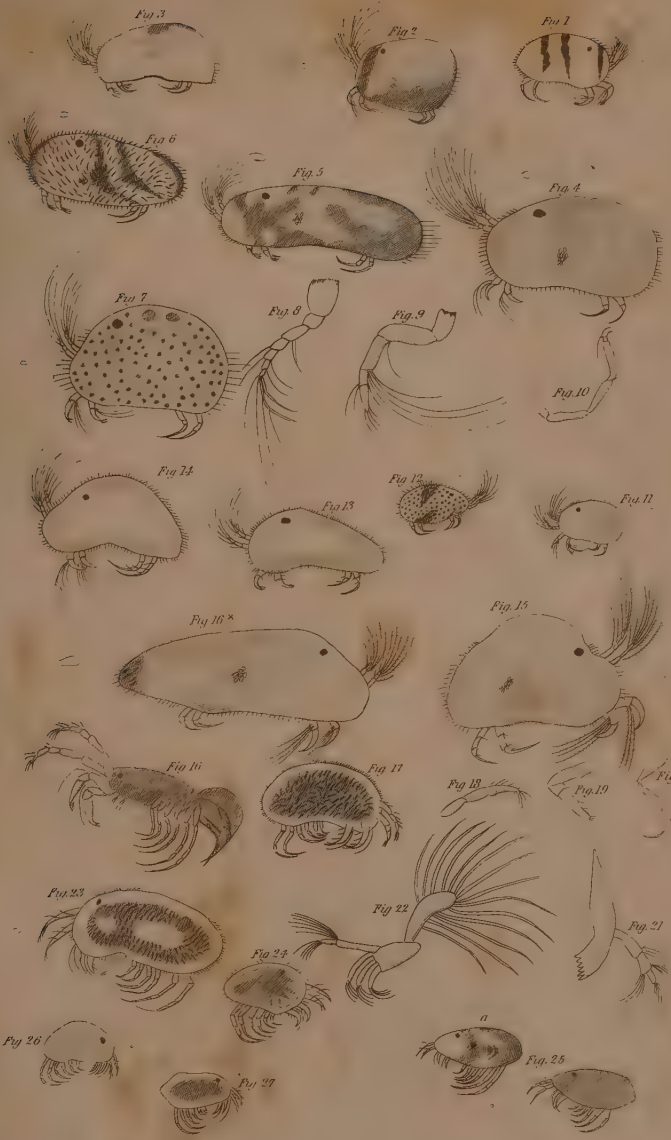
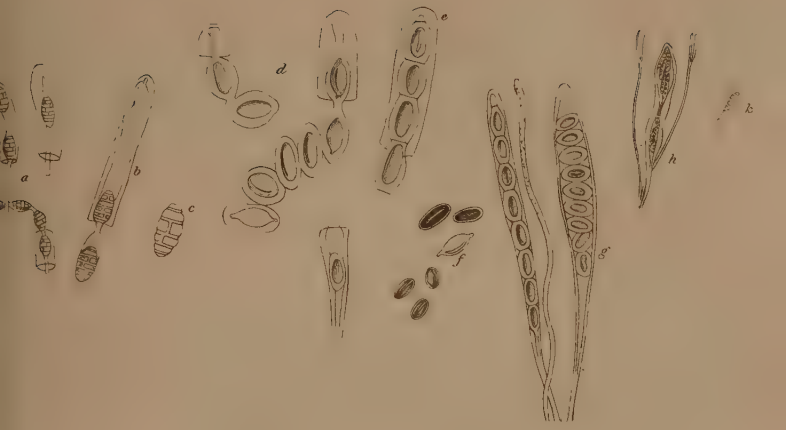




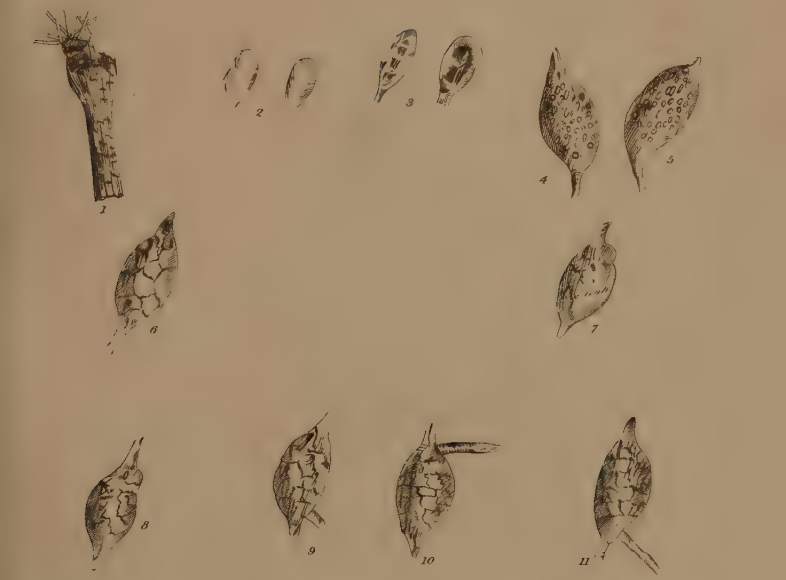
British Entomostraca.

Cerastium pedunculatum.



Asci of Sphæriæ.

M.J. Berkly Delt.



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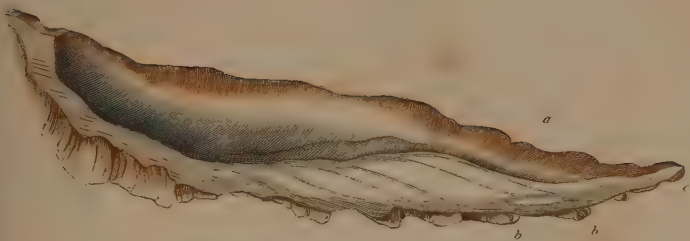

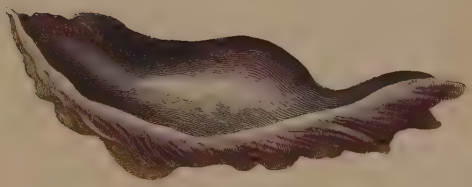

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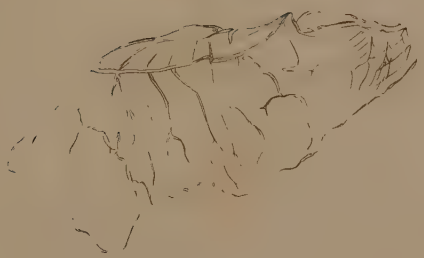

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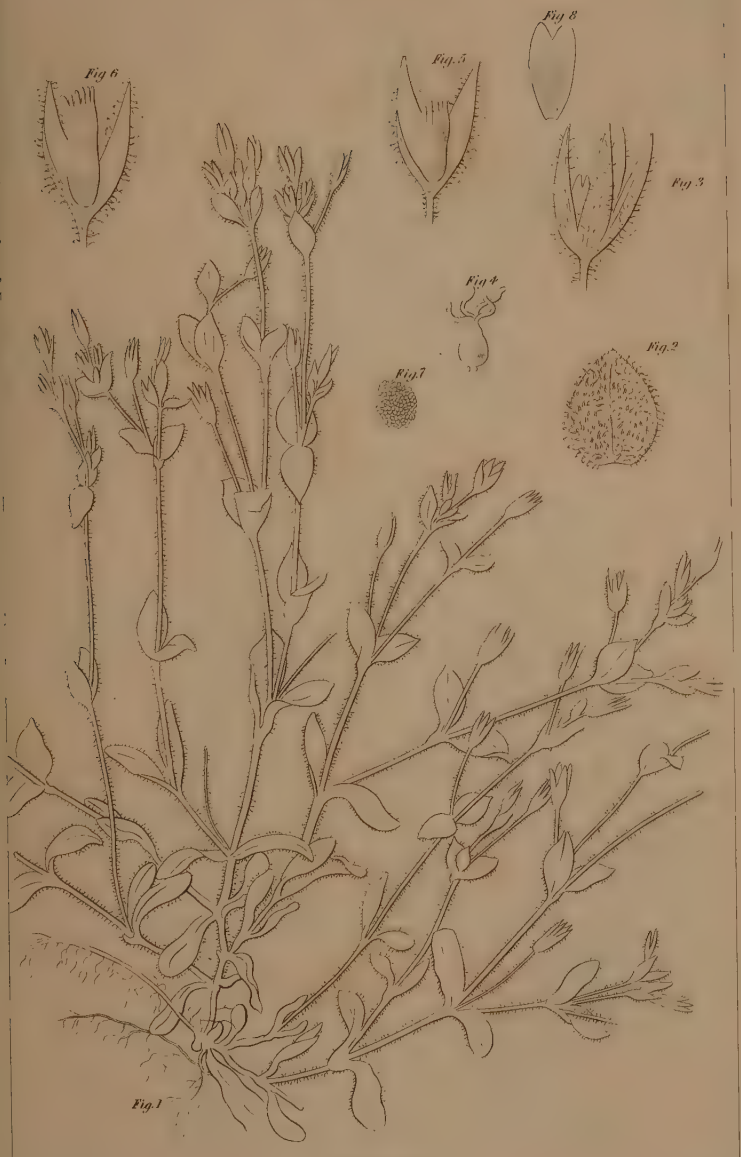

Cerastium alpinum.

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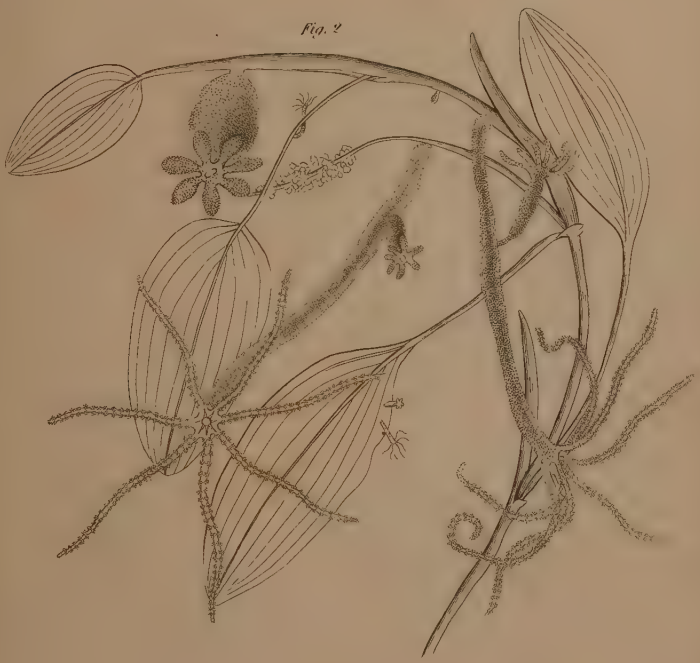
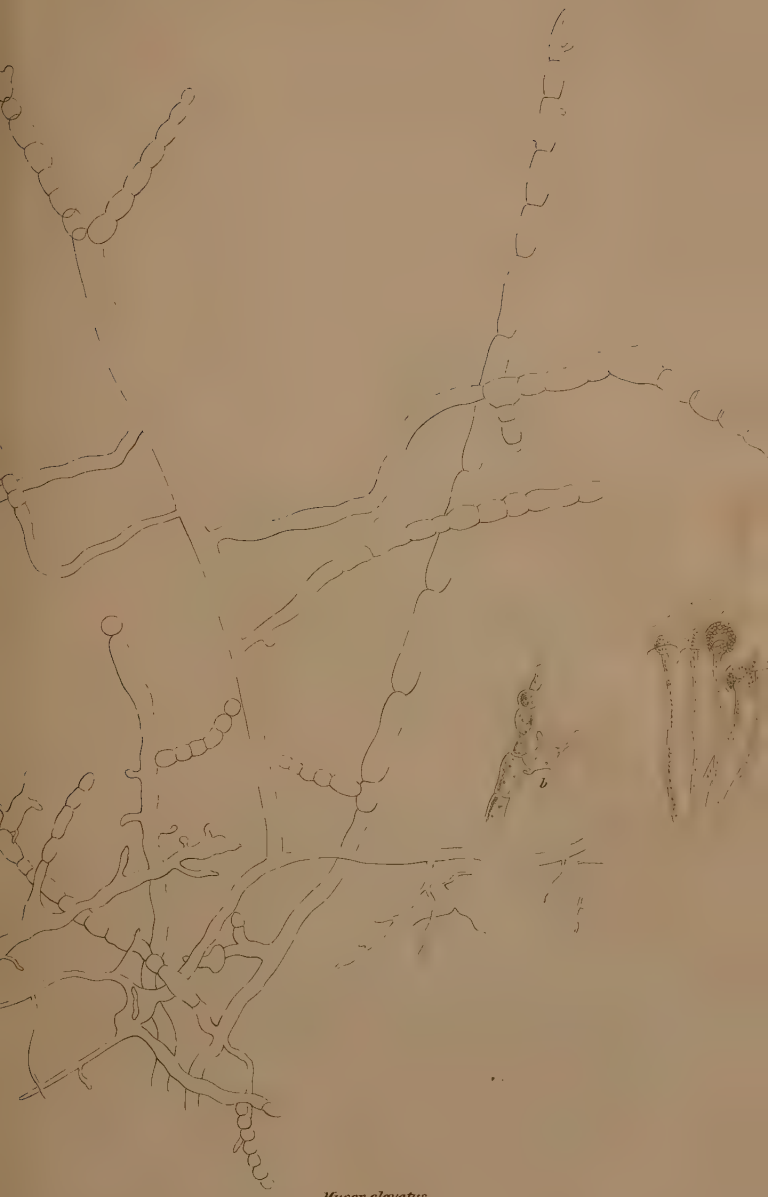
Fig. 1

Fig. 2





Mucor clavatus.

Reduced from the original drawing transmitted to the Geographical Society of London.

Victoria Regalis, *Schomburgh.*

W.H.Lizars sculp.

Crenilabrus multidentatus.

Chas. M. Curtis del.

W.H. Lizars sculpt.

Zool. & Bot. Mag.

a

Crenilabrus microstoma.